

VOLUME XIV

DECEMBER, 1914

NUMBER 8

THE AMERICAN MUSEUM JOURNAL

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Copyright photograph by Karl Moon

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MARY CYNTHIA DICKERSON, *Editor*

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WHITE WHALE PARTLY BEACHED IN A ROCKY COVE, ST. LAWRENCE RIVER

The white whale, or white porpoise as it is more correctly designated, reaches a length of eighteen feet and the adult animals are pure white except for a narrow brownish edging on the flanks and flippers. The young whales are entirely brown

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AMERICAN MUSEUM WHALE COLLECTION

By Roy C. Andrews

With photographs by the Author

THE active field work for the collection of whales began during the winter of 1907, when two North Atlantic right whales were killed at Amagansett and Wainscott, Long Island, and their skeletons secured for the Museum. The larger one, which proved to be of record size, was beached just at the edge of low tide where surf was continually breaking over it, and to secure all the bones of the skeleton was a difficult task. The weather was bitterly cold and after the second day's work a gale buried half of the body in sand. To dig it out it was necessary to build a breakwater of whale meat and even then the surf washed in from below, filling the pit so that we were working almost up to our hips in blood and freezing water while cutting blindly away at the bones buried deep in flesh. It took two weeks of the hardest kind of work to get the skeletons partially cleaned and loaded into a freight car for shipment to the Museum.

With these two specimens and a third right whale which had long been owned by the Museum, the Cetacean collection had a nucleus, and shortly afterward the skeleton of a splendid Atlantic finback was purchased through the generosity of Mr. George S. Bowdoin. Mr. Bow-

doin had already given the life-size model of a blue, or sulphur-bottom, whale which had been constructed in 1907 from measurements and photographs of a specimen taken at Newfoundland.

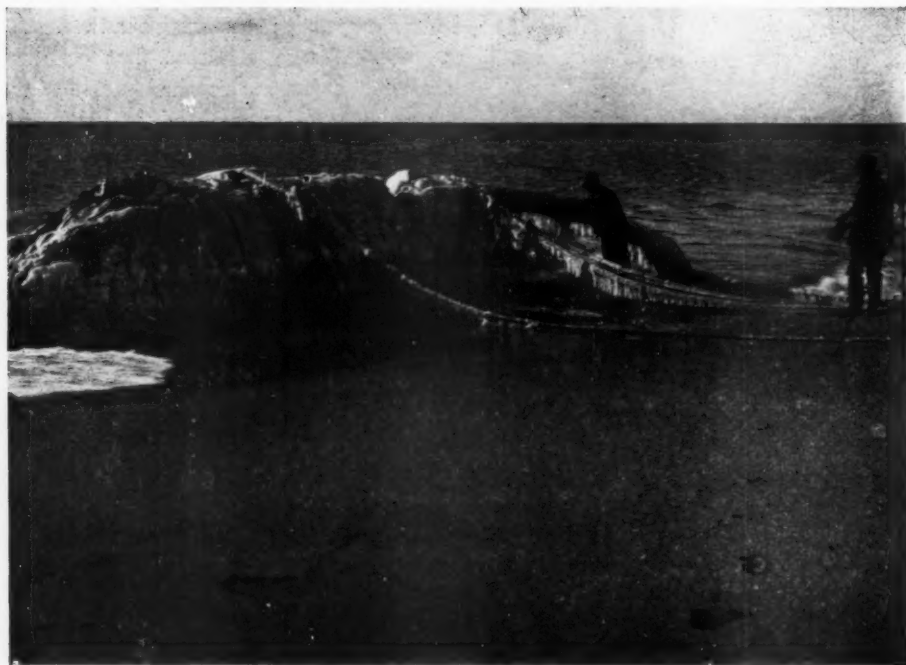
The building of this accurate replica of the largest animal which has ever been known to live upon the earth or in its waters, was something of a task. A light iron framework was first constructed; over this was stretched iron netting, and the exterior modeled in papier-mâché. The peculiar folds of the throat and breast were represented by means of long strips of wood cut to the proper shape and bent by steam. It required nearly eight months to build the model and before it was completed a whole world of experience had been gained as to "what not to do."

About the time the model was finished it was learned that three shore-whaling stations were in operation on the west coast of America, two being located on Vancouver Island and one in southeastern Alaska. Practically the only knowledge of the Pacific whales rested upon the work of Captain C. M. Scammon, whose book, "*Marine Mammalia*" had been published more than forty years before.

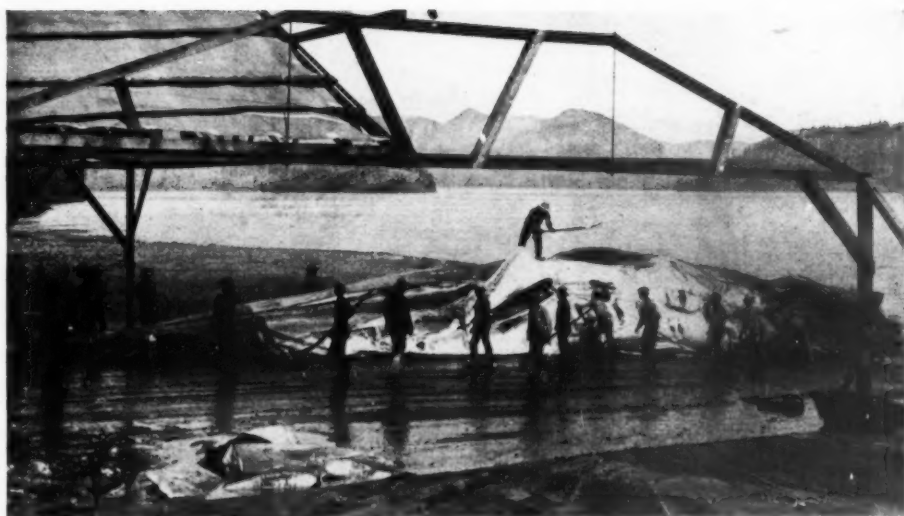
Just what relation the large Cetaceans



Young right whale taken at Amagansett, Long Island. This whale was probably only a few weeks old when killed. The skeleton was lost during a heavy storm which was beginning to break when the photograph was taken



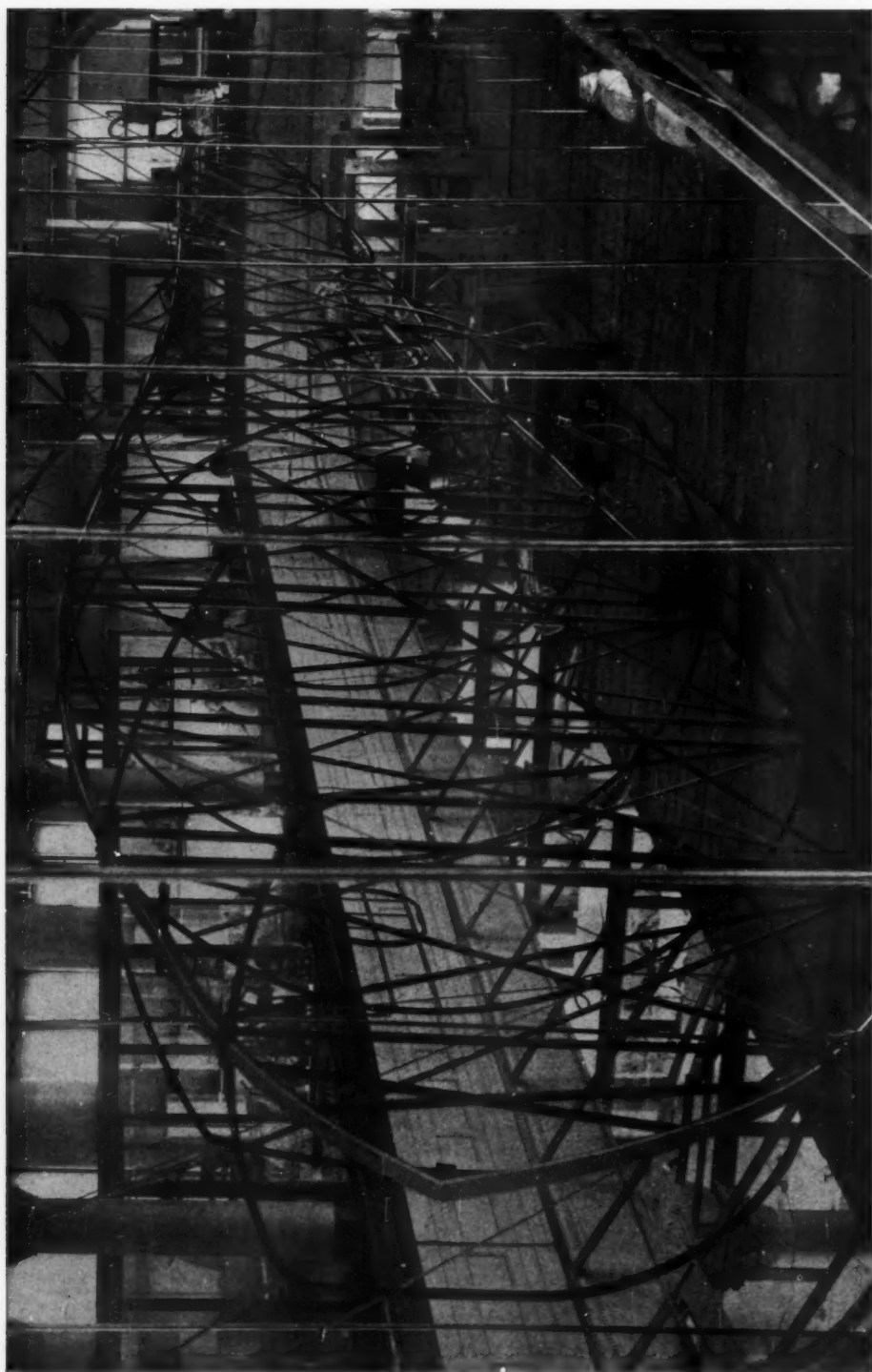
A record right whale taken in 1907 at Amagansett, Long Island. The whale was beached just at the edge of low tide and was soon covered with a heavy coating of ice. It was the largest individual of the species which has yet been recorded. Not only the skeleton but the entire baleen was purchased for the Museum



Stripping off the blubber from a blue whale at Vancouver Island. Longitudinal incisions are made along the side of the whale and the blubber torn off in great strips by the aid of the steam winch. It requires only fifteen or twenty minutes to flense one side of a large whale



Drawing up a blue whale at Vancouver Island. The blue whale, as far as is now known, is the largest animal which has ever lived upon the earth or in the water



IRON FRAMEWORK OF THE BLUE WHALE MODEL IN THE MUSEUM

The iron skeleton was covered with wire netting upon which papier-mâché was spread. Eight months were required for the building of the model



By courtesy of National Geographic Magazine. Copyrighted, 1911

BLUE OR SULPHUR-BOTTOM WHALE

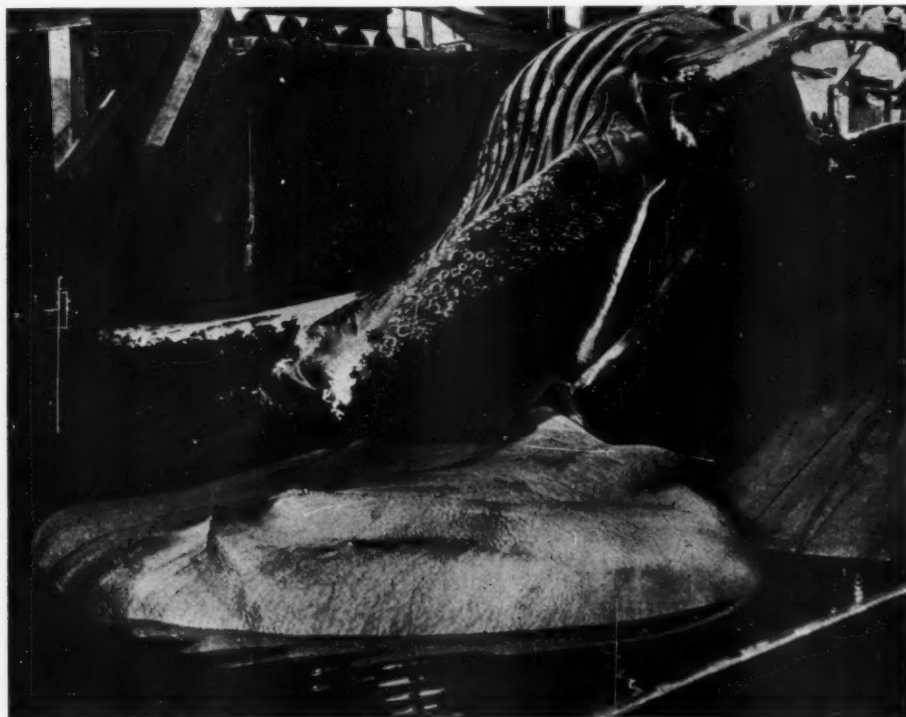
Life size model, length seventy-six feet. The weight of the animal from which the model was made was ascertained to be sixty-three tons

of this ocean bore to those of the Atlantic was unknown although some cetologists believed that all the large whales were cosmopolitan, and with this almost untouched field before us and the unusual facilities which a shore station offers for the study of such huge animals, the time seemed opportune to take up the work in the North Pacific.

Early in May, 1908, I left for Van-

more than five or six large whales, one can realize what a wonderful opportunity was presented for the study of a group of animals which, from the standpoint of evolution alone, are among the most interesting in the world.

The shore stations are located at convenient points near the feeding grounds of the animals, where the ships can come in each night bringing the day's catch.

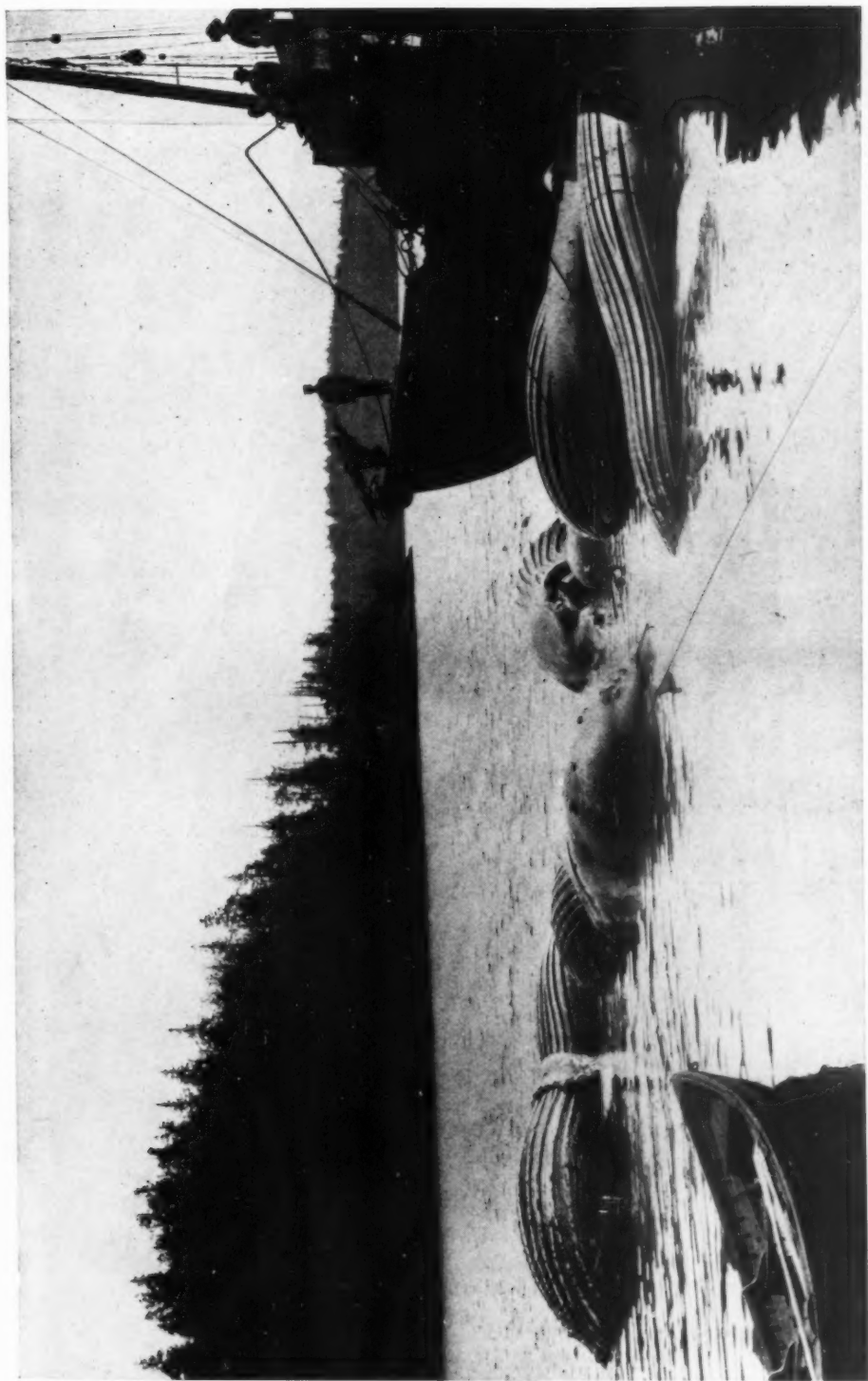


Humpback whale showing tongue. The whale's tongue had been forced out of its mouth by air which was pumped into the body in order to keep the animal afloat. The tongue is a soft flabby mass of tissue which is held in place by the jaw bones

couver Island and began work there. During the time spent at the stations almost a hundred whales representing four different species were under observation and each specimen was carefully described, measured and photographed.

When one stops to think that before shore-whaling began, a naturalist might spend an entire lifetime without seeing

The whales are anchored at the end of a long inclined platform called the "slip" and the huge carcasses, sometimes weighing seventy tons each, are drawn entirely out of the water. By means of his notebook, tape measure and camera the naturalist, if he works quickly, can bring away with him a fairly complete record of the animal's external anatomy before



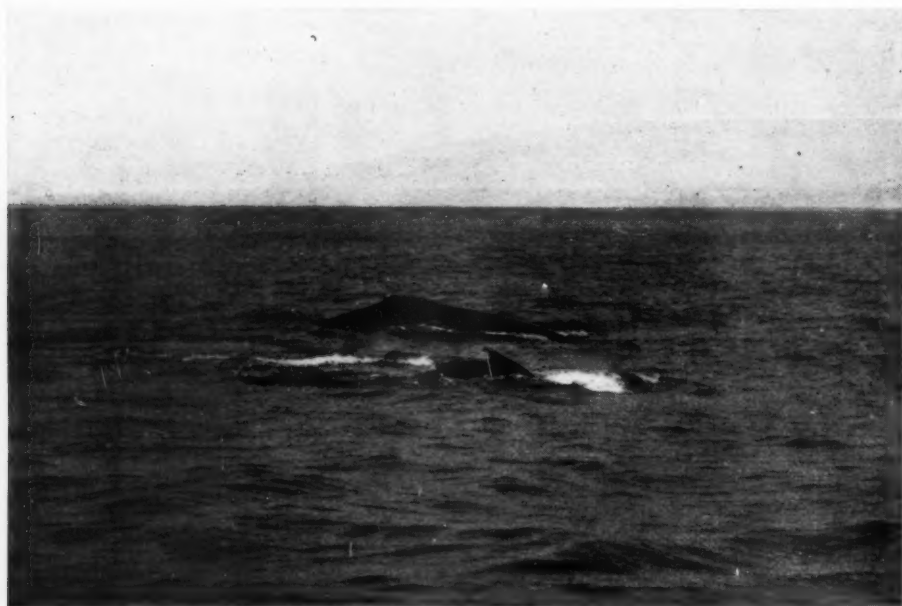
*By courtesy of National Geographic
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FIVE HUMPBACK WHALES AT VANCOUVER ISLAND TAKEN DURING A SINGLE DAY'S HUNT

the body is denuded of its blubber coating.

The blubber which covers the bodies of all Cetaceans is a layer of fat which acts as a non-conductor to prevent the bodily

heat from being absorbed by the water, and thus keeps the animal warm. It can be stripped off just as one would peel an orange and by means of the steam winch one side of an eighty-foot whale



By courtesy of National Geographic Magazine. Copyrighted, 1911

Two humpback whales diving. They had been feeding near the surface, coming up to blow every few seconds. The great diversity in the shape of the dorsal fin in this species is well shown by these two individuals



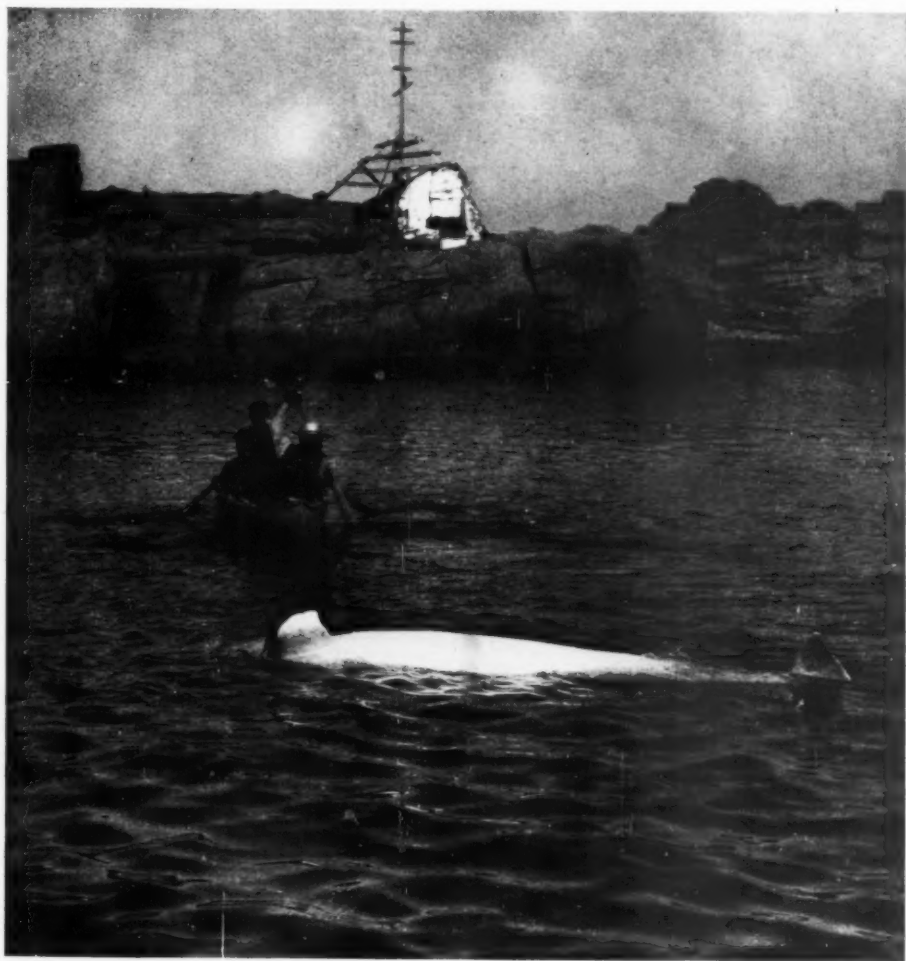
White whale diving. Passengers on the steamers traversing the St. Lawrence River often mistake the bodies of the white porpoises for whitecaps. This photograph shows the white whale in the act of diving with the maximum amount of body exposed above the surface of the water

can be "flensed" in twenty minutes. The body is then turned over by means of the "canting winch," the other side denuded of its blubber covering, and the viscera removed. The whale is hauled to the "carcass platform," the flesh stripped off, the skeleton disarticulated and the bones chopped in pieces.

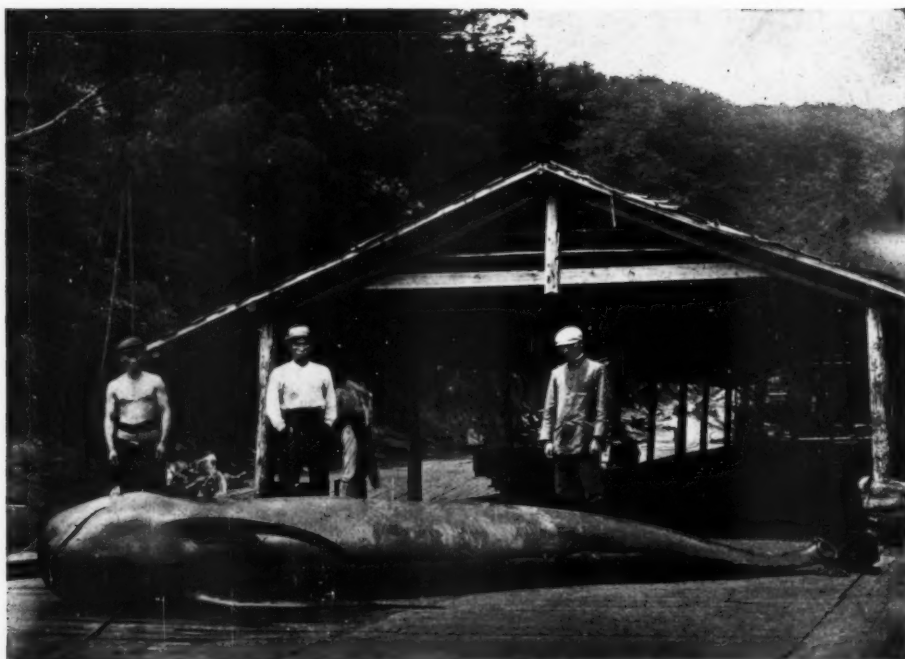
While this work is going on, an opportunity is given the naturalist to secure valuable observations upon the skeleton as the bones lie in position — if he be not afraid of blood and grease. The exami-

nation of fresh specimens is the only way in which many disputed points in the osteology of the large whales can ever be settled, for after the skeletons have been disarticulated the smaller bones are almost invariably lost in the tons of flesh with which the skeleton is covered.

Before 1864 when the invention of the harpoon gun by Svend Foyn made the shore station possible, dead whales which had been cast upon the coast were almost the only ones which ever came under the observation of a trained ob-



Towing a white whale to the beach. This animal had just been killed from a canoe and is being towed to the beach where its skeleton was removed for the Museum.



Pacific blackfish (*Glopiocephalus scammoni*). This is a very rare species and practically nothing has been known hitherto of its external characteristics

server. These specimens were nearly always in a more or less advanced state of decomposition and badly bloated by gases so that little of their true form remained. All Cetaceans change color very rapidly after death and unless the animal is seen before it has been exposed to the air, accurate descriptions of its color in life cannot be obtained. For instance, the Atlantic finback for many years has been described as "black" although it is never black in life.

When the work of the Vancouver Island stations was finished I went northward to study finbacks at Tyee, on Admiralty Island, Alaska, for at the southern stations only humpback, blue and sperm whales had been taken.

I came back to New York in the fall with much information about the Pacific whales and an intense desire to continue the work. An opportunity soon presented itself and the following June

I went to Quebec to study and collect the beautiful "white whale," the *marsouin blanc* of the French dwellers along the St. Lawrence River. Although this species is a true ice porpoise and is never found where the water is far above the freezing point, yet early in the spring the animals come into the St. Lawrence River by thousands, their white bodies looking more like foamy wave crests than things of life. They are hunted for their skins which give the "porpoise hide" of commerce, each animal being worth about seven dollars.

The whales were killed by first shooting them with a heavy musket as they rose to blow, then paddling up in a small canoe and throwing a harpoon as they thrashed their white lengths about upon the water. The first whale we killed was a full-grown male absolutely pure white, except for a narrow grayish edging on the flukes and fins. It was

beached in a sandy cove where the gray rock wall rose in a jagged mass, making a perfect background for the white body, its purity of color intensified by the crimson streaks of blood which dripped from the bullet holes. There was something almost unearthly about the picture, the beautiful ghostlike animal, a very Spirit of the North, seeming strangely out of place away from its icebound home. Five complete skeletons were secured of the *marsovin blanc* on this expedition as well as plaster molds of its body.

Early in August of the same summer a temporary appointment on the United States Steamship "Albatross" bound for a cruise of zoölogical exploration in the Dutch East Indies was offered, and I joined the ship at Manila, Philippine Islands. In the first part of the expedition the only Cetacean material which was secured consisted of several skulls of the Southern Pacific blackfish. These have thrown new light on the blackfish of the southern waters and will probably

necessitate an entire revision of the genus.

After the East Indies cruise was ended I went up to Japan early in February of 1910 and obtained permission from the Toyo Hogeï Kabushiki Kaisha [Oriental Whaling Co., Ltd.] to study and collect specimens at their stations. The president and directors of the company not only offered the free use of their ships and stations but also presented to the Museum all the skeletons which we desired to collect.

This was an unrivaled opportunity, for the Japanese whales had been in the most complete scientific darkness and what species were to be found there was quite unknown. Work was begun at the island of Ōshima close to the northern entrance of the Inland Sea and continued for several months at this and neighboring villages. The skeleton of a splendid blue whale seventy-nine feet in length was secured. I was also intensely delighted to find that a whale



Whaling station at Alkawa, Japan. The stations are always located in a little bay near the feeding grounds of the whales. In the distance is seen a large steamer which was used by the Russians as a "floating factory" and was captured by the Japanese during the late war with Russia



Shooting a sei whale. This photograph was snapped at a speed of one one-thousandth of a second just as the harpoon had struck the whale. The smoke, sparks and wads of oakum with which the gun was loaded are seen in the air. Note the whale's nostrils which are widely expanded as the animal was drawing in its breath preparatory to descending into the water

called the *sejhal* by the Norwegians and the *iwashi kujira* or sardine whale by the Japanese, was being taken here.



Sei whale drawing in its breath. The nostrils are shown widely expanded and greatly protruded

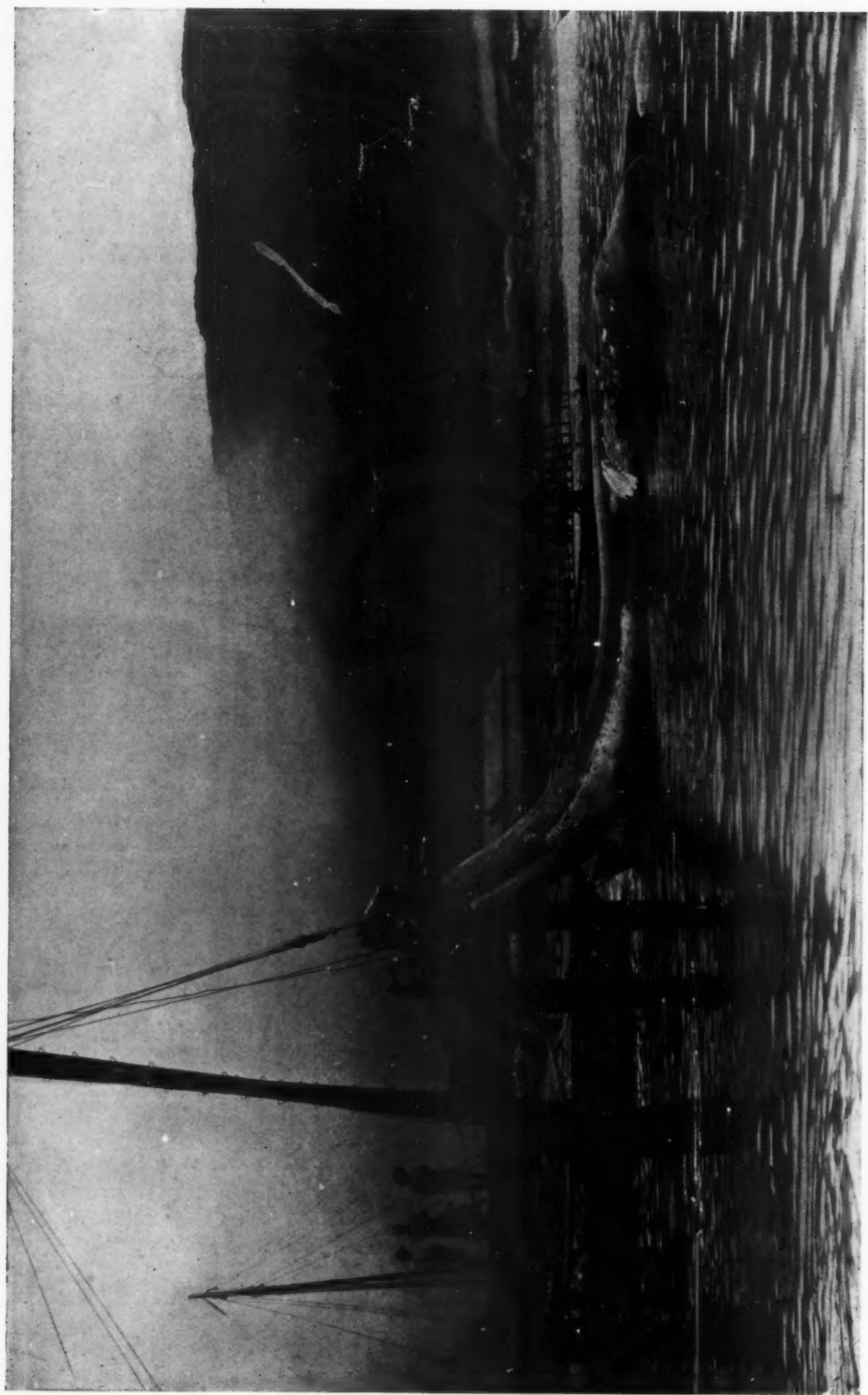
This whale, although forty to fifty feet long had never before been recorded in the Pacific and although it had formed the basis of the Japanese summer fishery for nearly fifteen years, not a single individual had reached the attention of a scientist. Whether or not this species will prove to be synonymous with the sei whale (*Balænoptera borealis* Lesson) of the Atlantic has not yet been determined, but it is the subject of a monograph now in preparation.



Killer whale secured for the Museum. This species wages a continual warfare upon the gray whale and often assists the human hunters by frightening the gray whales so badly that they turn on their backs and lie motionless at the surface of the water

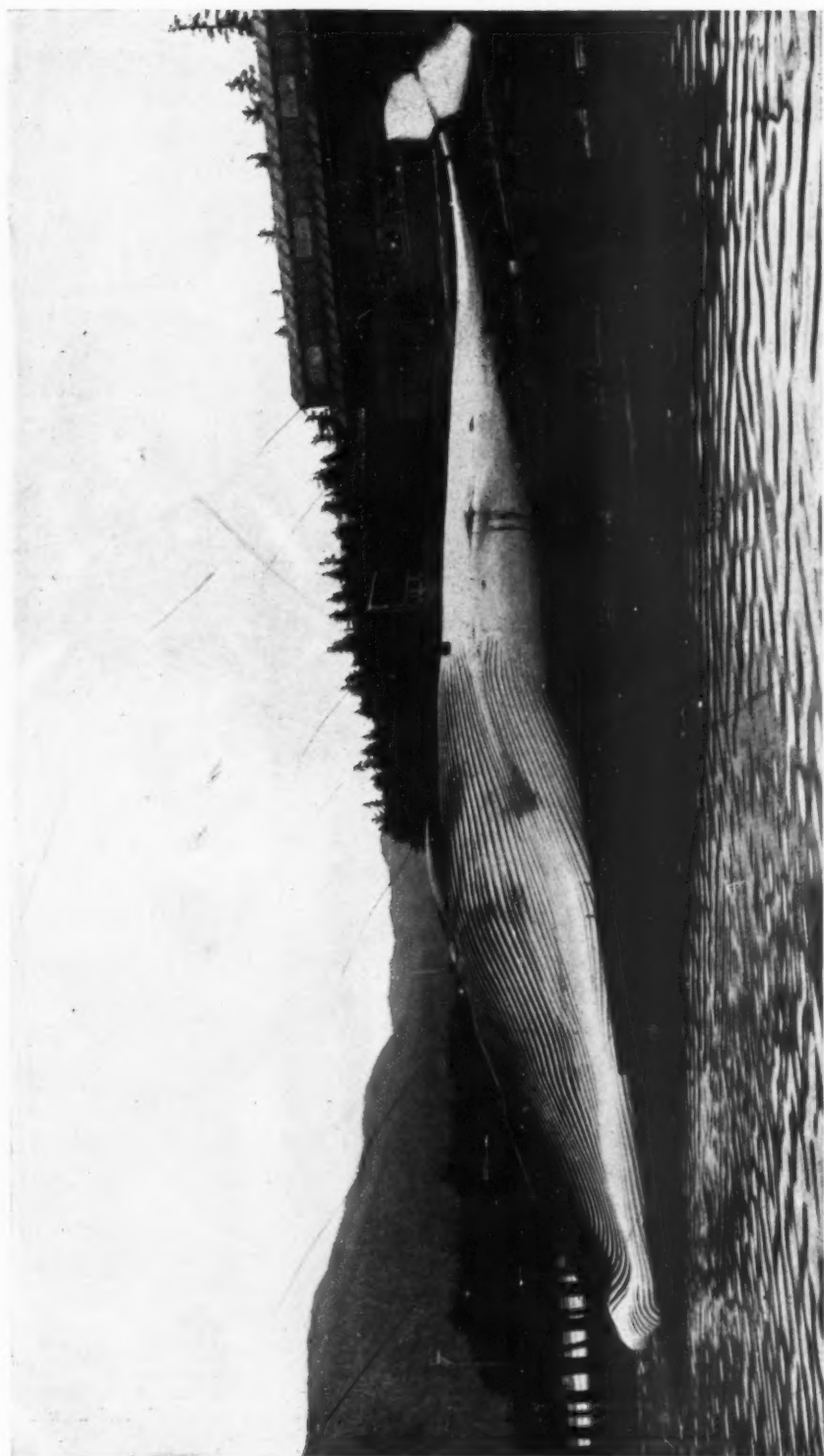


The spout of the finback whale rises to a height of from fifteen to twenty feet. It is exceedingly difficult to photograph unless as in the present case, there happen to be mountains to form a dark background. Finbacks can undoubtedly swim faster than any other large whale, probably reaching a maximum speed of thirty-five miles per hour



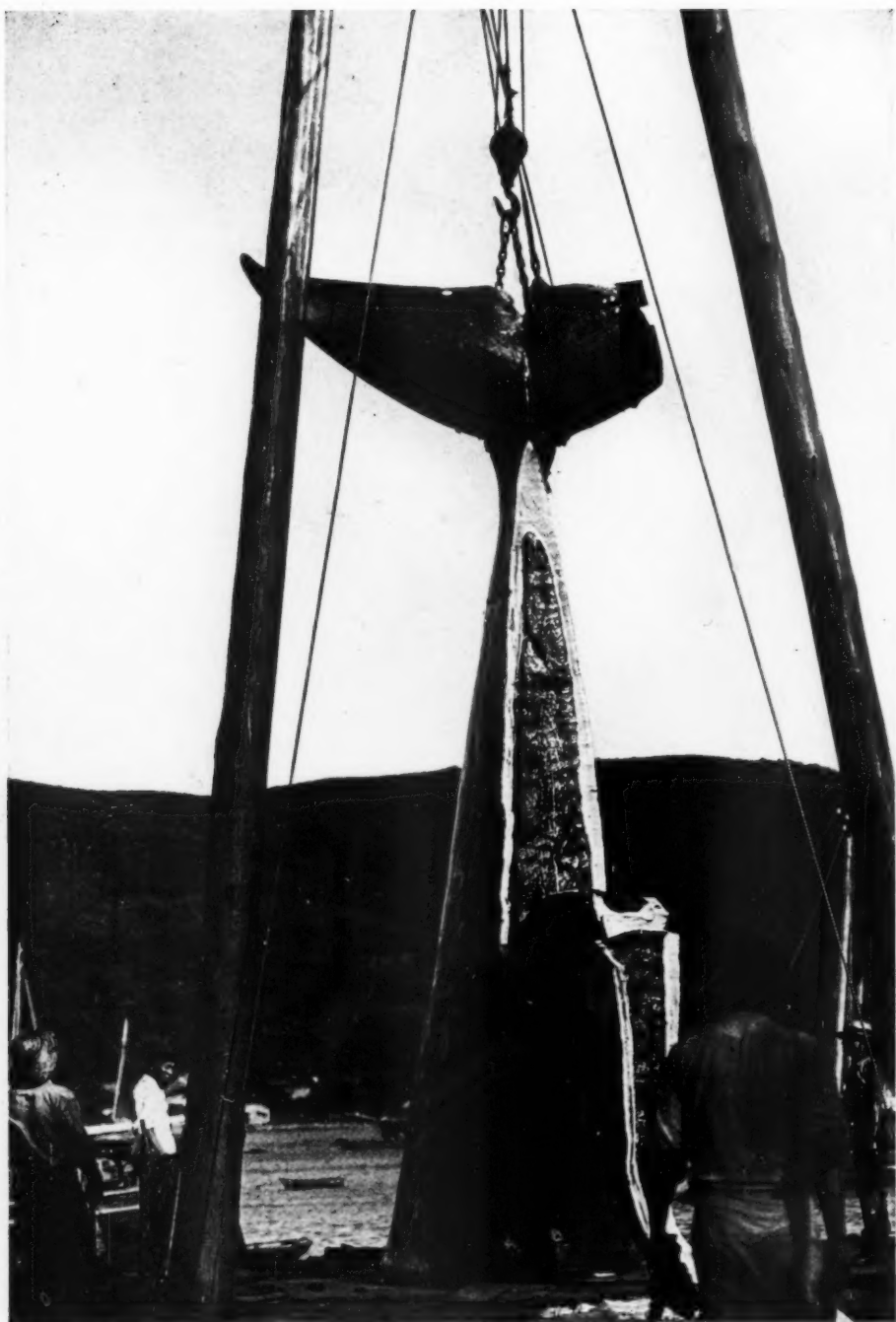
CUTTING IN A FINBACK WHALE AT AIKAWA, JAPAN

The whale is being drawn partly out of water and will be cut in sections before flensing



*By courtesy of National Geographic
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THE GREYHOUND OF THE SEA — A FINBACK WHALE, ALASKA



CUTTING IN A SEI WHALE

This method of cutting in is followed only in Japan. The entire posterior portion of the whale is drawn out upon the wharf

A fine killer whale (*Orca orca*) was also obtained at Ōshima and later in the year a second killer was taken.

After shipping the skeletons to New York from Shimonoseki, Japan, the work was continued in the northern part of the country at the little village of Aikawa. Many *sejhal* were taken here during the summer, giving a splendid opportunity to investigate the species.

At Aikawa, skeletons of a large fin-back, a sixty-foot sperm whale and ten porpoises were secured. The sperm whale was killed especially for the Museum by Captain Fred Olsen, who did

his best to secure a large individual. Off the coast of Japan, sperm whales sometimes appear in herds of from twenty or thirty up to five hundred individuals, and when a school is found it is an easy matter for each ship to kill five or six; one of the Japanese gunners even brought in as many as ten at one time. The crate containing the skull alone of the sperm whale which was shipped to the Museum, had a space measurement of twenty-six tons and was of such size that it would barely pass through the hatch of the ocean liner which carried it to New York.



Cutting in a gray whale, Korea. The body is being divided so that the posterior half may be drawn upon the wharf



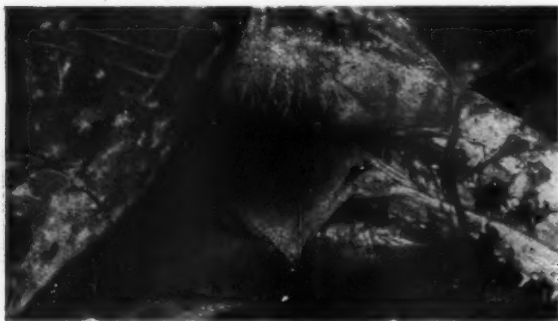
Lower side of head and breast of female sperm whale. There is considerable difference in the shape of the head of the male and female of this species, a fact which has not been widely recognized by cetologists

The porpoises were of great interest. Ten specimens were secured comprising four different genera and five species. One proved to be a very extraordinary specimen representing a new genus which differs in many respects from all other members of the family.

While in Japan it was learned that a whale called the "devilfish" by the Japanese, and which I could identify only as the California gray whale, was taken off

the coast of Korea during the winter. This information was exceedingly interesting because, since 1880, this species had been lost to science and naturalists believed it to be extinct. It was impossible to secure specimens of it at this time, but in the following year I returned to Japan to investigate the so-called "devilfish." As suspected, it was found to be the lost California gray whale and two complete skeletons

were secured as well as photographs, measurements and descriptions of over thirty individuals. A very large humpback whale was also taken, and a third killer, together with a considerable amount of alcoholic material for embryological and histological study. The humpback skeleton was unfortunately destroyed by fire in the summer of 1913 after it had been



The tongue of the sperm whale contrasts strongly with that of the humpback shown in a preceding photograph

shipped to Ward's Natural Science Establishment at Rochester, New York, for cleaning.

During the intervals of field work active operations for securing skeletons of the smaller Cetaceans by purchase and exchange have been going on and several very valuable specimens have been acquired. Among the most notable is the complete skeleton and baleen of the pygmy right whale (*Neobalæna marginata*) one of the rarest and most interesting of living whales.

is being studied as rapidly as possible and the results published as volumes of the *American Museum Memoirs* under the title *Monographs of the Pacific Cetacea*. Part I, *The California Gray Whale*, has recently appeared and another volume dealing with the *sejhal* is well on the way toward completion.

This material, illustrating one of the most interesting and important groups of living mammals, is at the present time utterly inaccessible to the public or to scientific men because of the lack of exhi-



Removing the spermaceti from the head of a sperm whale. Twenty barrels of liquid spermaceti were secured from the head of this specimen, the skeleton of which was sent to the Museum

Our collection of Cetaceans is to-day probably the most important in the world, especially in the almost complete representation of the large forms. We need greatly the bowhead, or Greenland right whale, and prospects are good for securing a skeleton through an expedition which may leave for Hudson Bay next summer. Another humpback will also have to be obtained in the near future.

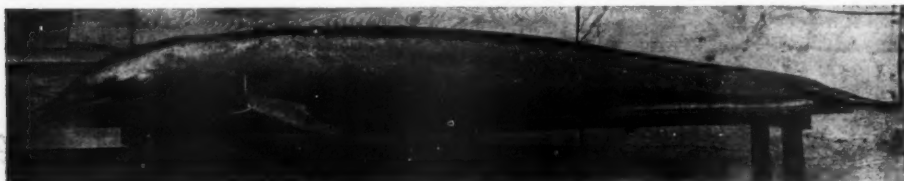
The material which has been acquired

bition space. The foundations have already been laid for the hall of water mammals in the east court, but operations have been suspended indefinitely because the necessary funds for the completion of the building have not been advanced by the city.

No more skeletons can be prepared until room is available and this valuable material, much of which could never be duplicated is suffering badly and may even be permanently injured. The

American Museum has an opportunity to exhibit the finest collection of aquatic mammals in the world. It has both the material and the land area and no need is greater than the completion of the court building. Until that time all exhibition work in this department is at

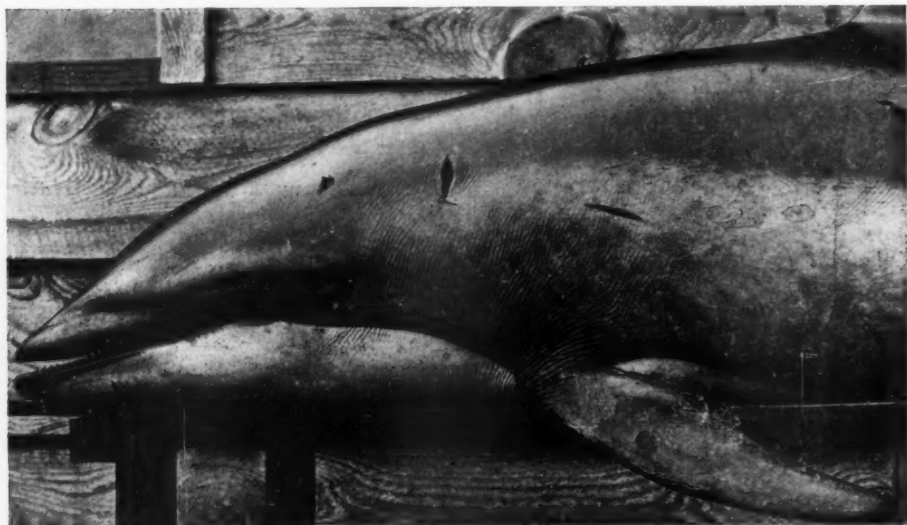
a standstill, the collections which have been gathered at great labor and expense are in danger of deterioration, and the public is being deprived of one of the most instructive and interesting exhibits which any museum can offer its patrons.



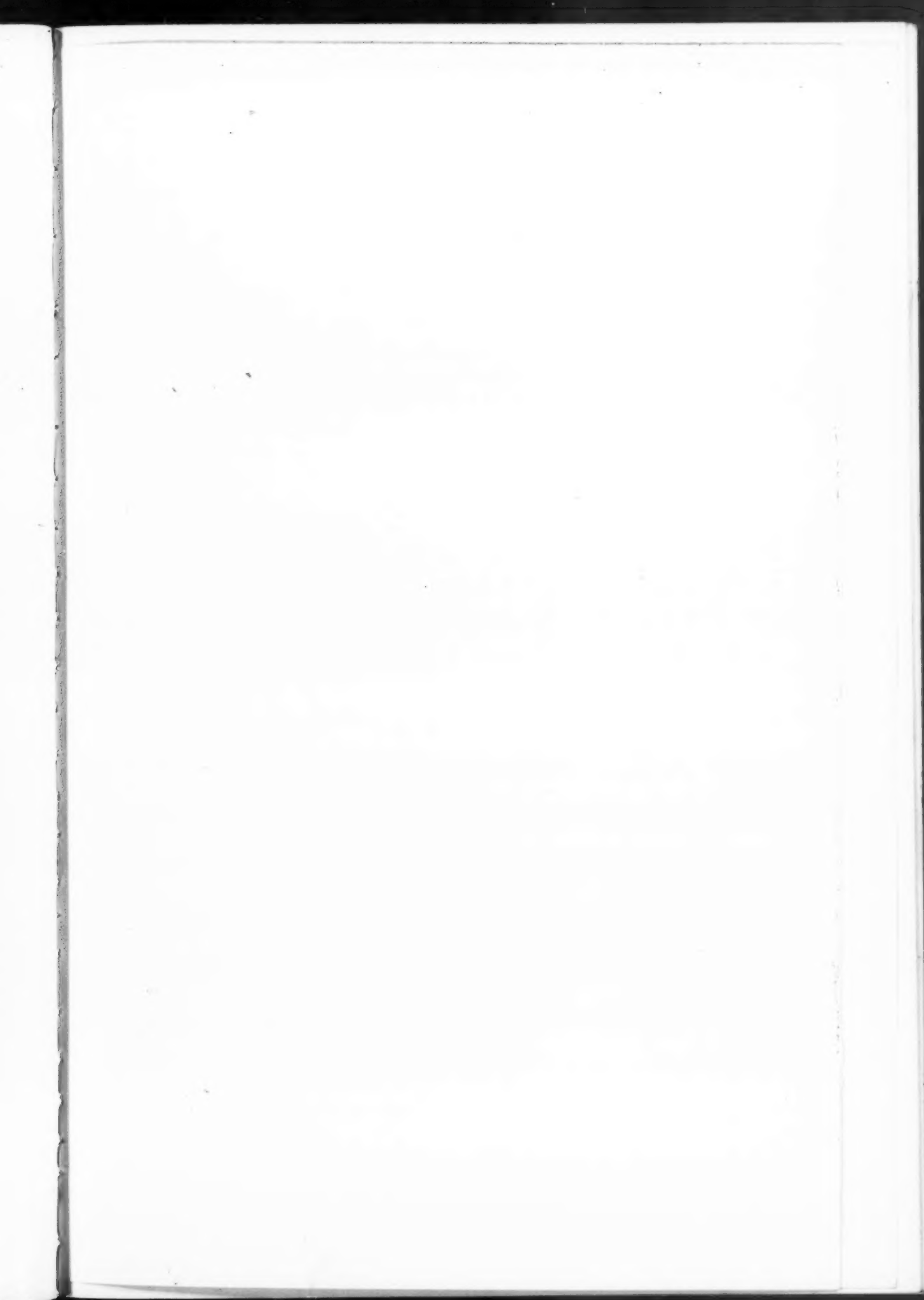
Side view of Pacific right whale porpoise (*Tursio borealis*). Three fragmentary skulls of this exceedingly rare species were the only specimens preserved in museums before the expedition to Japan secured three complete skeletons, with accompanying data of external structure. (Note the absence of a dorsal fin)

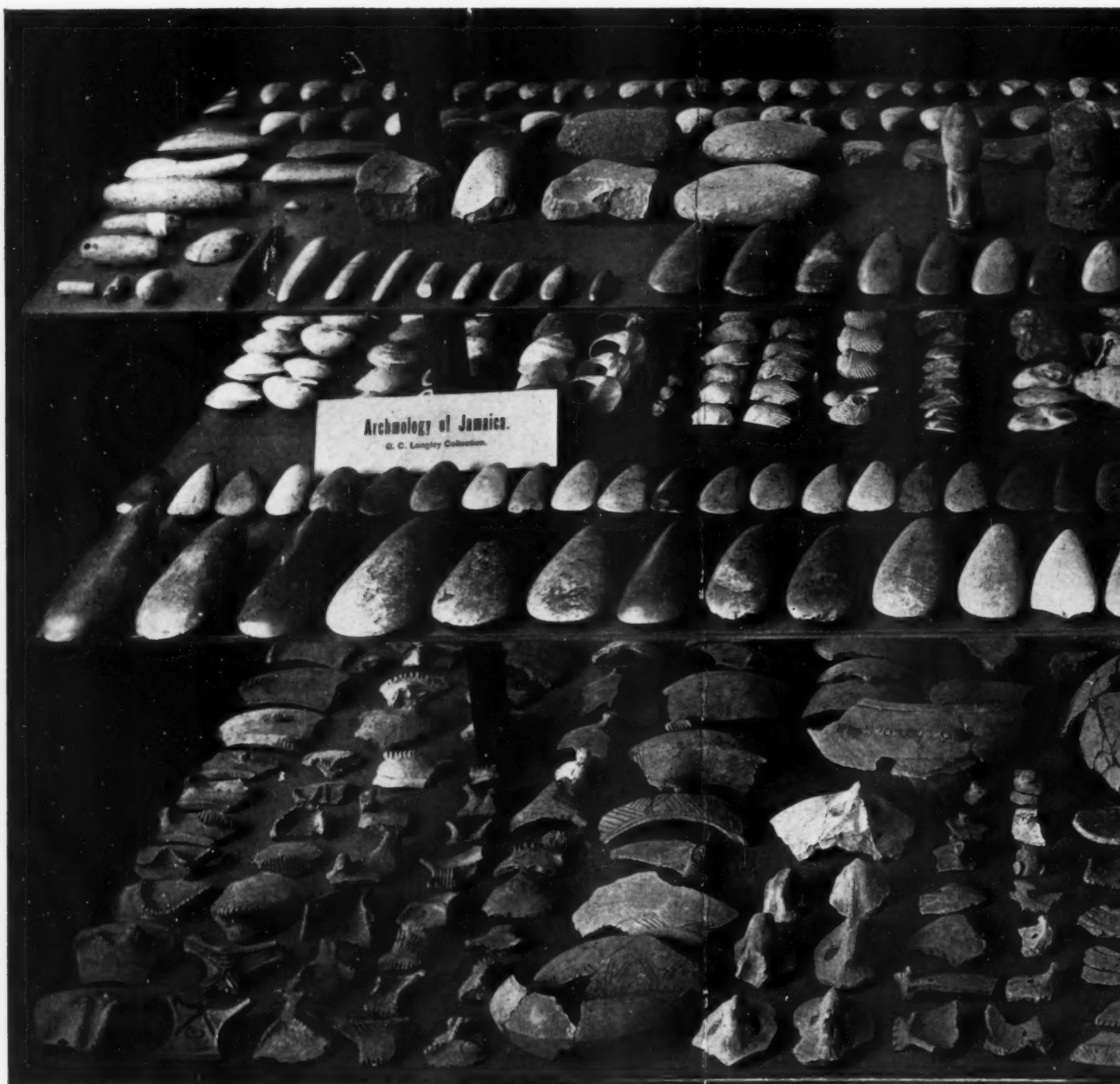


Ventral view of Pacific right whale porpoise (*Tursio borealis*)



Head of a Pacific dolphin (*Lagenorhynchus obliquidens*). This is one of the most common dolphins of the North Pacific and yet it is rare in collections. Five skeletons were secured for the American Museum



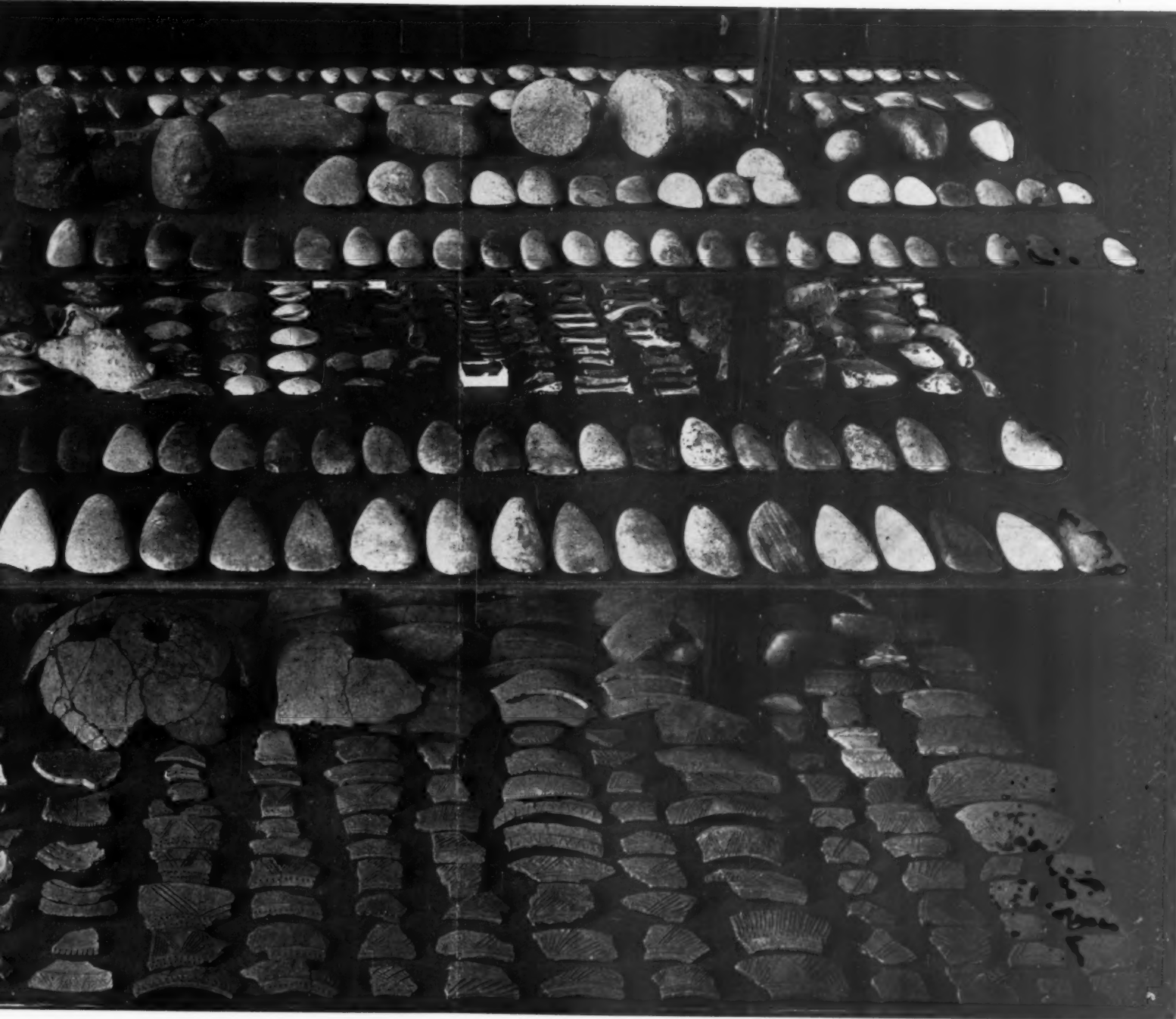


The following objects can be seen on the UPPER SHELF: stone pendants and spindle-shaped celts at the left, idols of stone in the centre, stone axes or celts in double rows about the margin of the shelf and at the right and left of the idols various rubbing stones or pestles. Two of these rubbing stones (at the right) have flat smooth base; others (at the left) have grooves on both top and bottom, one groove made in grinding the broad or cutting end of an axe, the other narrow groove made in forming the pointed end of the axe

COLLECTION FROM THE KITCHEN

On the MIDDLE SHELF note the following: a large stone of unusual size and polish, also a large collection of sea shells and bones of fish and the conch found in the food of the Arawak

The BOTTOM SHELF shows a rich collection of stone tools and construction from some forty pieces of the bottom



THE KITCHEN MIDDENS OF PREHISTORIC JAMAICA

The following: two rows of celts or axes among which are some of the collection of shells and bones. Immense numbers of land and sea shells found in the kitchen middens show the character of much

each collection of fragments of pottery. Near the center is a reconstruction of the bottom of a pottery vessel. The fragments were found at

Specimens collected by Mr. G. C. Longley and presented in November, 1914, to the American Museum

a depth of five feet, associated with wood ashes, shells and cony bones. At the left are pottery fragments showing various patterns of incised decoration, many forms of handles of vessels and in the extreme corner a series showing a type of decoration in which bands of clay were added to the exterior of the vessel before firing. These bands have incised lines across them and probably represent snakes. At the rear of the shelf are fragments of Arawak baking slabs. Various reconstructions that have been made show that these slabs must have been about two feet wide and elliptical in shape. They were used for baking cassava bread. Similar ones are encountered to-day among the Indian tribes of northern South America

REPORT ARAWAK ABORIGINES

INTRODUCTION
which contains some of Pelham Manon's work. Mr. Longley for an amateur archaeologist the aboriginal in

These kitchen middens contain fish, turtle and other remains of pottery and other lines which were found of these shell heaps throughout, with a few of shell are some of the islands of the West Indies.

Stone Images are good examples of religious rites. They are presented, but the number of pendants. Identical across the entire

FOR the visiting that in the Caribbean 1912 however study of the island and to variations in the purpose of each possible of the

These aboriginal were first known the voyages of the second voyage when he was of Cuba that he and soon came to the coast of Jamaica. "Santa Gloria" description of the verdure of the mountains of which he The Admiral who at first new who soon became

KITCHEN MIDDENS OF JAMAICA

REPORT OF AN INVESTIGATION OF THE KITCHEN MIDDENS OF THE ARAWAK INDIANS, WITH A HISTORICAL INTRODUCTION ON THIS ABORIGINAL RACE NOW EXTINCT ON THE ISLAND OF JAMAICA

By G. C. Longley

INTRODUCTORY NOTE FROM THE DEPARTMENT OF ANTHROPOLOGY: A collection from Jamaica, which contains some fifteen hundred objects, has been presented to the Museum by Mr. G. C. Longley of Pelham Manor, New York, and is now on exhibition in the South American gallery on the third floor. Mr. Longley for the last six years has passed the winter months on Jamaica, and being an enthusiastic amateur archaeologist, has occupied his time while there in exploring the kitchen middens of the Arawak, the aboriginal inhabitants of the island.

These kitchen middens are the refuse heaps of the Arawak and consist largely of shells and pottery, fish, turtle and cohy bones, implements and of course ashes. The most common finds are fragments of pottery and celts and axes of stone. The pottery when ornamented generally has designs in straight lines which were made by pressure of some sharp object while the clay was soft. The typical stone axes of these shell heaps are remarkable for workmanship and beauty of form. They are very symmetrical throughout, with the cutting edge nicely rounded and tapering to a point at the opposite end. Celts of shell are sometimes found, but they do not occur on Jamaica as frequently as on some of the other islands of the West Indies.

Stone images, often in the form of pestles occur, and Mr. Longley was fortunate enough to find two good examples. They are thought to be idols and at any rate were probably connected in some way with religious rites. Mealing stones and stones used to grind and sharpen the celts and axes are well represented, but the most interesting objects from the anthropological point of view are the cylindrical stone pendants. Identical pendants are worn to-day as insignia of office by chiefs or headmen of tribes, across the entire length of northern South America.

FOR the past six winters I have been visiting the island of Jamaica, that wonderful winter paradise in the Caribbean Sea. It was not until 1912 however, that I began to make a study of the aboriginal Indians of the island and to conduct systematic excavations in certain localities with the purpose of collecting as many relics as possible of this bygone race.

These aborigines were the Arawak and were first known to civilization through the voyages of Columbus. It was on the second voyage of Columbus in 1494 when he was coasting the southern side of Cuba that he sighted land to the south and soon came to anchor on the north coast of Jamaica. He named this land "Santa Gloria" and gave an eloquent description of the beauties he beheld, the verdure of the shore, the splendor of the mountains and its good harbors, one of which he called "Puerto Bueno." The Admiral here encountered Indians who at first made a hostile display, but who soon became friendly after they were

given clothes and other articles unknown to them and later sent ambassadors to the Spaniards with gifts of fish, fruit and cassava bread.

While one cannot say with absolute certainty where Columbus landed on Jamaica, and in consequence cannot give the exact locality of the Admiral's Santa Gloria and Puerto Bueno, it is probable that Santa Gloria was the modern Saint Anna's Bay and Puerto Bueno either the modern Dry Harbour or Rio Bueno, more likely the former, as the harbor better fits in with the description given by Columbus. It is interesting to note that the excavations I conducted in the interior of the island were made due south of Dry Harbour and Rio Bueno, so that the Indians met by the Spaniards in Puerto Bueno were probably of the same tribe as those from whose village sites I collected many relics.

Columbus visited Santa Gloria again on his fourth voyage in 1503 and beached his ships in a small cove — and there is an inlet known to this day as "Christo-

pher's Cove." Columbus remained here for one year and the Spaniards with him had an opportunity to study the customs of the Arawak.

Oviedo, official historian to the court of Spain, a contemporary of Columbus, tells of the almost ideal existence of the Arawak. From his accounts, as from those of later writers, it appears that they took life very easily. As is customary with so many primitive tribes the women tilled the fields, and did the principal work, while the men engaged in the chase or in fishing, and spent the intervals comfortably in their *hamacas*, forerunners of the modern hammocks, for which there is little doubt we are indebted to the Arawak.

Picture to yourself a green, fertile hilltop, from which the wood has been cleared by fire. Surrounding it are several other hills, on which the woods and undergrowth are still in a virgin state, and which consequently allow a safe escape in case of a raid from the dreaded Caribs. In practically all of the West Indian islands, caves are plentiful, and must have proved of the utmost value as hiding-places. I have conducted explorations in a cave near Alexandria in which one could easily hide hundreds of men. The gulleys surrounding the hilltop on which the village site is found, assured a plentiful crop of cassava, while the neighboring hills swarmed with conies. Snails, too, were plentiful, and judging from the shell-heaps existing to-day, must have been eaten in enormous quantities.

The hilltop, like all hilltops in a limestone country, has many hummocks on it, and upon these the aborigines built their octagonal houses, made of upright posts, thatched with palm leaves. According to early writers, these huts frequently were of a considerable size, the floors made of hard clay and always swept

clean. In front of each was a green slope, and back of it the refuse heap on which the empty shells, broken stone implements, and broken cooking pots were thrown. Apparently the cooking was also done here. In excavating some of these refuse heaps, we find thick layers of wood ashes, mingled with the shells. Upon the location of the village depends the character of the shells. In inland middens are large snail shells with an occasional sea product, such as a conch or clam shell. The bones of large fish are also found occasionally in inland middens, and I dug out some vertebrae of the rock fish, and the jaw bone of a parrot fish, which by its size indicates that the fish was three or four feet in length. Ancient writers tell us that the large fishes were reserved for the chief so it may have been that we were uncovering the kitchen midden of the most important dwelling in the village.

My excavations were conducted at St. Acre, Scarboro, Greenhill and Armordale, in St. Ann Parish, and at Logie Green in Clarendon Parish. My first operations were at St. Acre where some few years ago I discovered large shell deposits when a new road was being cut on the property. The next season I unearthed some fragments of pottery in the deposits. This led me to conduct larger excavations, and I engaged native laborers to assist me in the task. I discovered several small hummocks on the St. Acre hilltop, and made trenches through these, sometimes five or more feet deep, and found deposits of shell, ashes, charcoal and fragments of pottery and stone implements at different levels, as if the Indians had abandoned the village site, and had returned after a time. In this work I was frequently assisted by men who thought I was digging for gold. I paid them for any specimens they brought to light and in

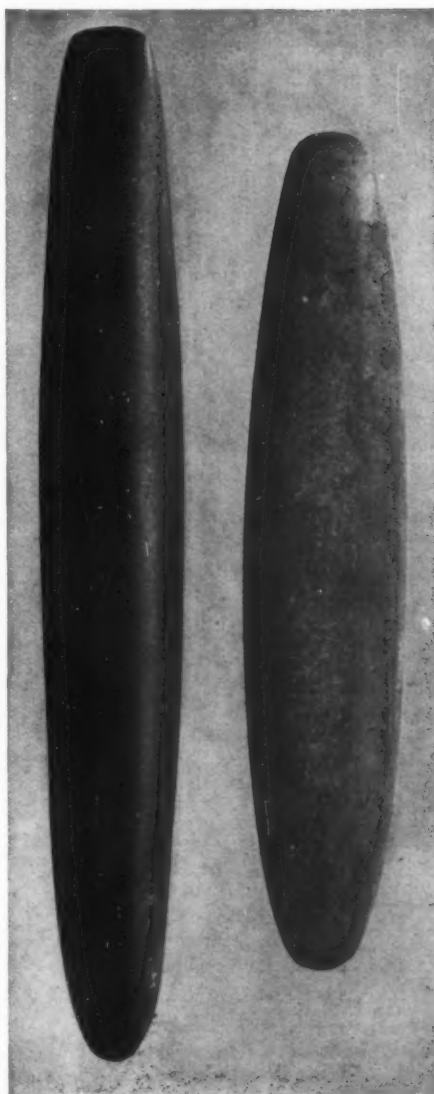
consequence the news spread after a while that I was paying real money for Indian stones, and I was rewarded by having many hatchets, stone pendants, and pestles brought in to me.

My work at Greenhill was the most extensive, and from the middens there — although they are similar to the St. Acre and other middens — I obtained the best specimens.

The extinction of the Arawak was so complete that there are but few similar cases in history. People like this race, living in a tropical climate, quite unused to work of a laborious nature, would speedily feel the effects of forced labor. After the Spaniards came, they needed workers for the gold mines in Haiti, for the making of roads and the cultivation of crops in Jamaica. They forced the Indians to labor for them, and with the cruelty characteristic of the age, killed off the natives with almost incredible swiftness.

It is only natural that the Arawak came to have a different view of people whom they at first fondly imagined were sent from heaven, and it was not long before they took to their mountain retreats, in order to escape forced labor and a painful death. But what could a peaceful race, with practically no weapons of defence, do against the superior weapons and the bloodhounds of the Spaniards? The Jamaican Arawak were exterminated by 1558, only sixty-four years after the discovery of the island, and none were left to tell a later generation of their tribal customs. The meager accounts given by Columbus and his contemporaries have to be supplemented by such conclusions as we can draw from a study of the relics left in their kitchen middens.

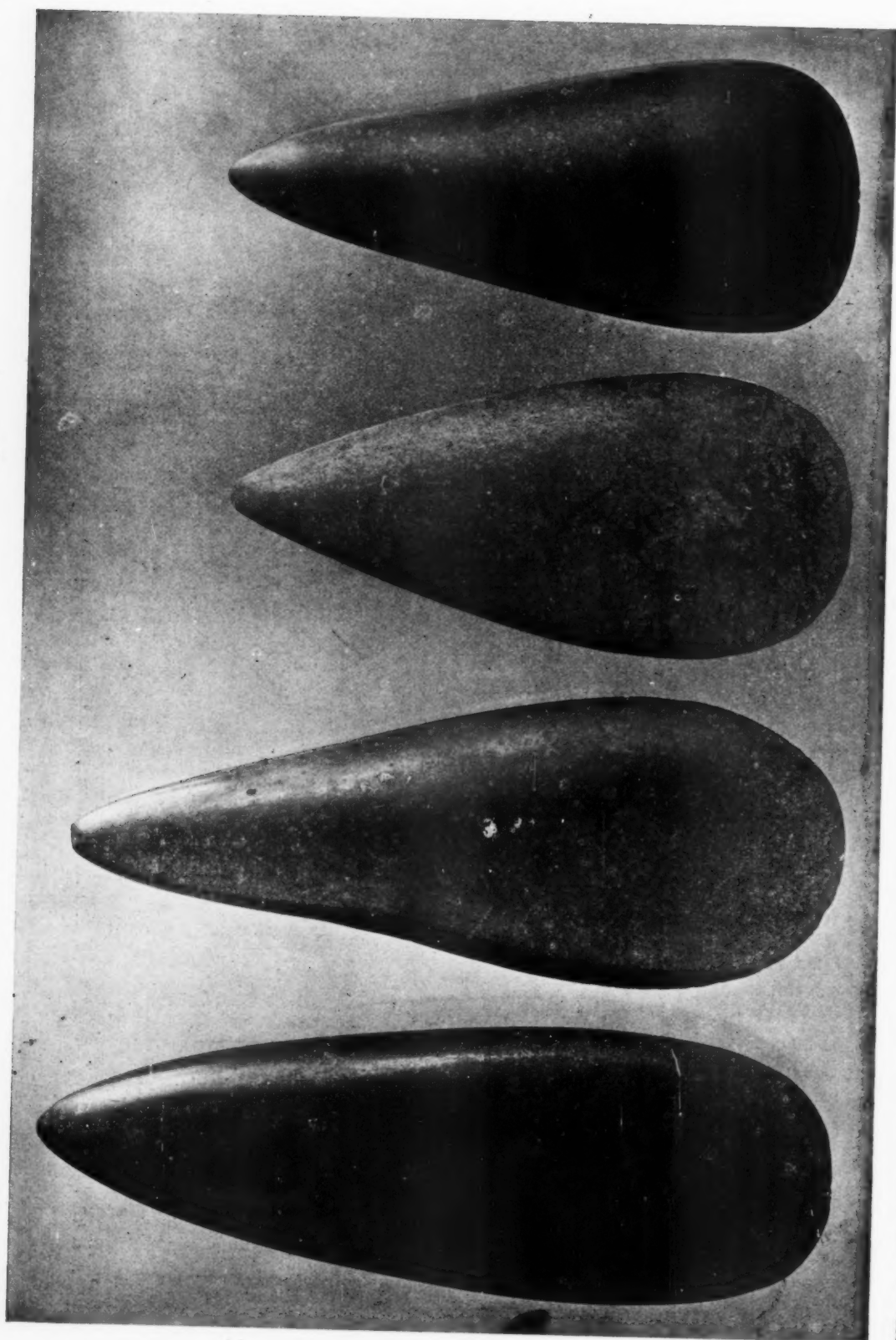
Columbus, in his description of the natives of Jamaica, lays special stress upon their proficiency in the art of work-

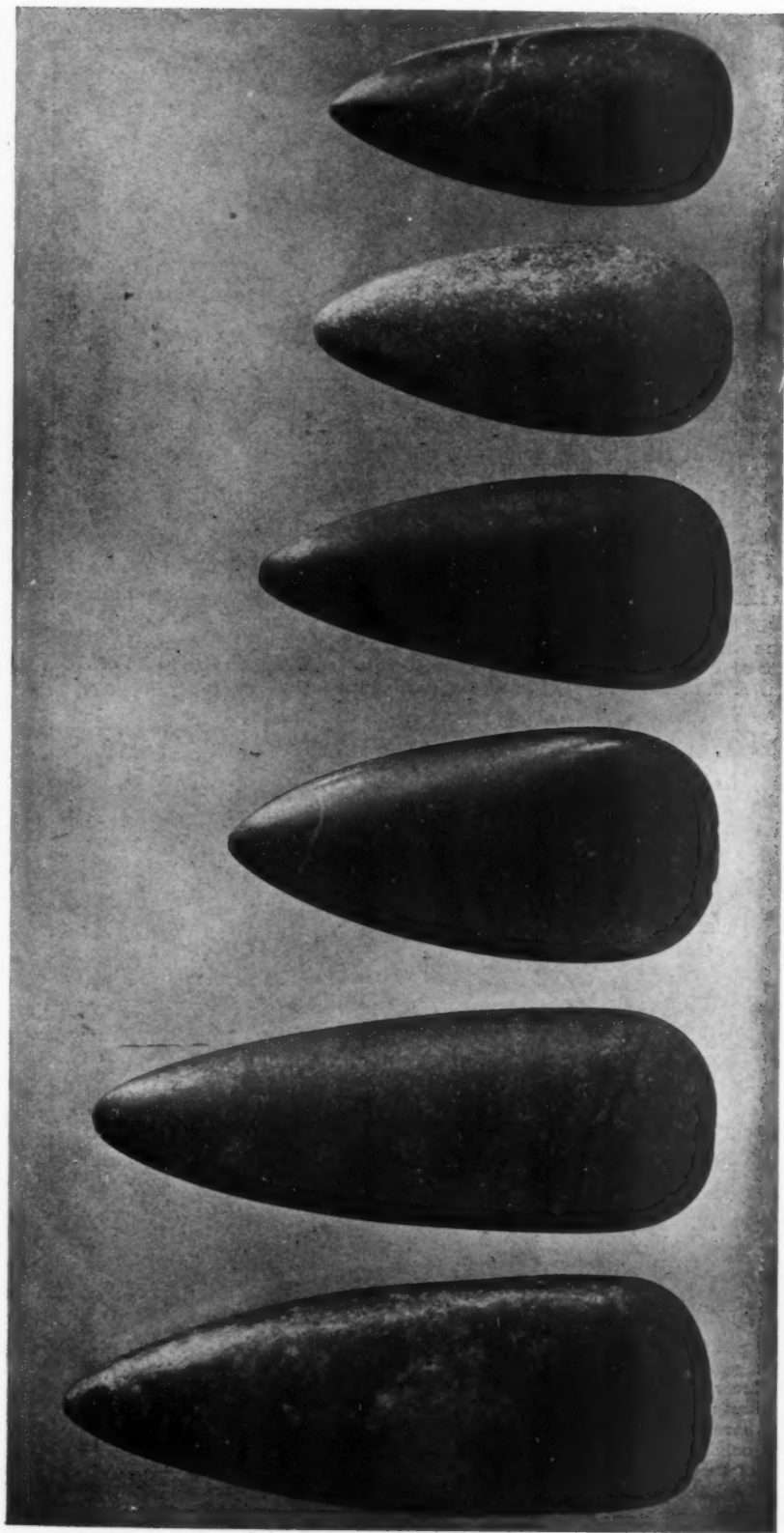


Two of a considerable series of spindle-shaped celts found in Jamaica by Mr. Longley. They were probably used as chisels. The specimens figured are of black and green stone respectively

ing stone, and mentions having seen some good stone ornaments worn by the heads of tribes.

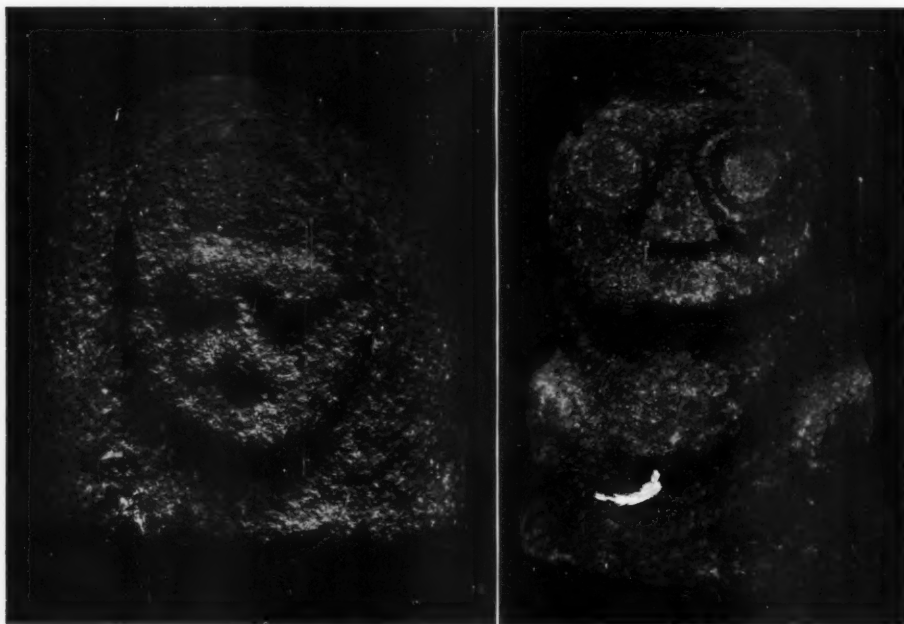
Two notable objects in the collection are the two idols or zemes of brown sandstone, about five and one-half inches in height. They crudely represent the human form, and undoubtedly were con-



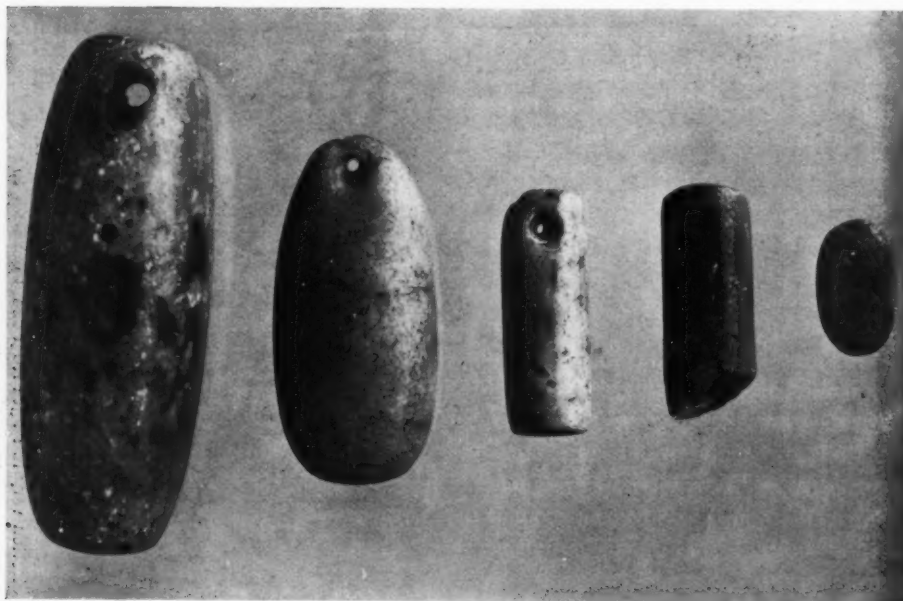


STONE AXES FROM JAMAICA

Stone axes and celts are found in large numbers throughout the West Indies. They served the prehistoric Indians as axes, knives and chisels. It is a popular belief to-day among the ignorant on the island that such stones are the product of celestial phenomena and they are widely known as "thunder bolts" or "thunder balls." The collection contains two hundred and sixty such specimens. The specimens shown are highly polished and vary in color from dark or blackish green to light green, gray or brown. The celts in the collection vary in length from about one inch to nine inches. The largest stone in the plate above (page 298) is about nine inches long



Idols of brown sandstone (5½ inches high). Such idols were undoubtedly connected with the religious rites of the Arawak. Various animals also were used as idols, the snake on the island of Haiti, the parrot on Jamaica and the monkey on the more southern islands

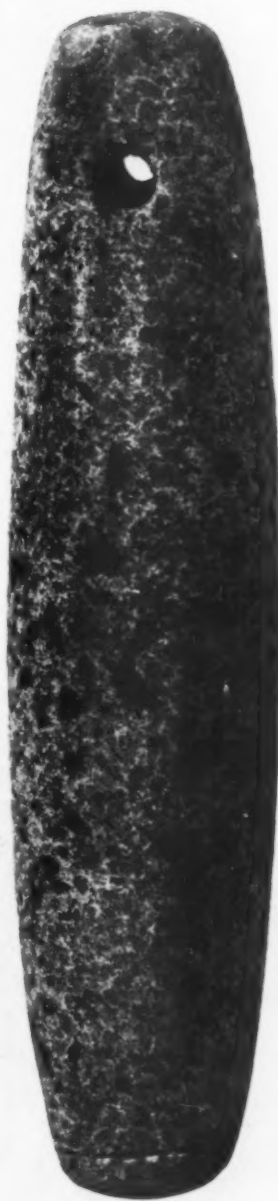


The most interesting objects in the Longley collection, from the anthropological point of view, are cylindrical stone pendants. Pendants identical with the large one at the left and the one shown on the following page are worn to-day as insignia of office by chiefs or headmen of tribes across the entire length of northern South America. The hole in the pendant at the right is so small that one wonders how the Arawak could have drilled it without the use of metal tools. The white stone (1½ inches long) in the middle has not only a hole through the upper end but also a hole drilled at right angles to its lengthwise from one end of the pendant to the other. In the same class with the stone pendants are shell ornaments with holes drilled through them, which the Arawak also wore suspended around the neck

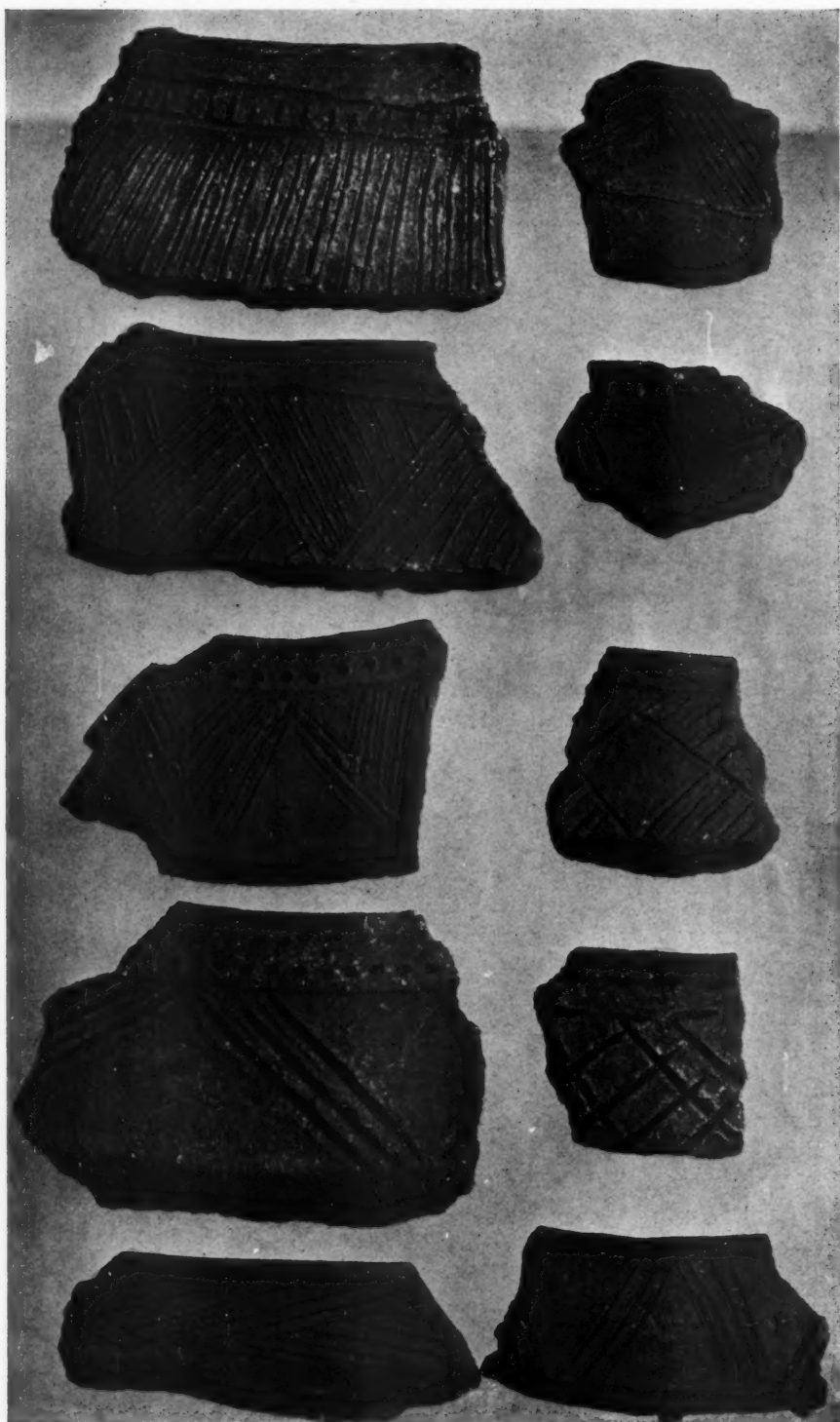
nected with the religious rites of the Arawak. Like many prehistoric tribes, the Arawak had good and bad deities which they worshipped. They had in fact, it is known, several goddesses to whom homage was paid, and offerings were made at certain seasons of the year, and on certain festivals. These ceremonies were conducted by the shamans, who were both priests and medicine men. The deities generally were represented by zemes, small stone or wooden idols, the former often in the shape of amulets which were worn around the neck, suspended from a cord. Various animals were also worshipped, the snake on Haiti and Porto Rico, the turtle and the parrot on Jamaica, and the monkey on the more southern islands.

Among the objects made by working stone, fall also the pendant ornaments. These have been fashioned with considerable skill and certainly with great patience, when one takes into account that the Arawak had no metal tool to work with, but laboriously fashioned the pendants with the aid of sand, stone and an incredible amount of rubbing. The hole in the pendants is often so small that it makes one wonder how the Arawak could have drilled it with the rude tools they had.

Pottery is perhaps the most important class of Arawak relics, because the forms of their vessels and the kind of designs used in decorating them show the artistic status of these ancient people. They used a great deal of pottery in cooking their food over wood fires. The evidence of this is seen in the external smoked and blackened portions of vessels discovered. The pottery is fragmentary, as is always the case in these middens. Entire objects of terra cotta from the West Indies are extremely rare, having been found only occasionally in caves, where they were put with the remains of the dead,



Cylindrical stone pendant of the Arawak such as is worn to-day by chiefs of tribes in the northern part of South America. Such pendants were fashioned with the aid of sand and stone and an incredible amount of rubbing



POTTERY FRAGMENTS FROM JAMAICA

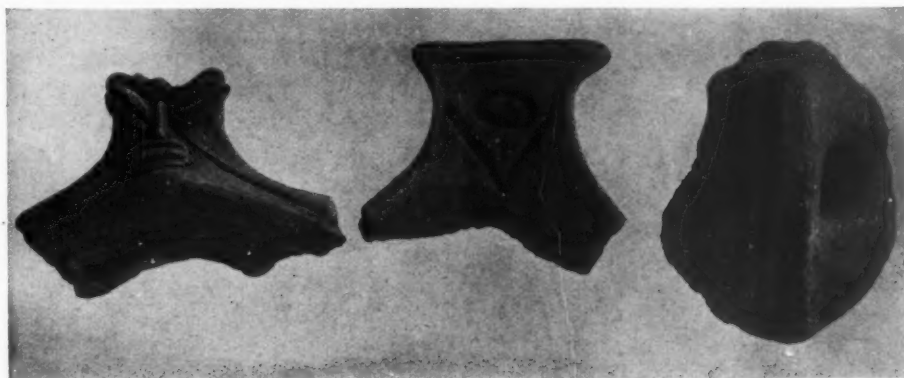
The Arawak used a great deal of pottery in cooking their food over wood fires, a fact proved by the smoked and blackened portions of vessels discovered. The vessels were made by coiling bands of wet clay one upon another and afterward smoothing them down with a stone before firing. Decorations when they exist have considerable variety, made with a sharp instrument such as a shell or flint

as receptacles of food for the last journey of the departed.

Arawak pottery was never glazed and I could not find any on Jamaica that had been painted in colors, the clay usually being an even shade of brick red, with an occasional sherd of a buff color. A greater part of the pottery found is without ornamentation of any kind. It is only now and then that a decorated piece is discovered.

There is a great variety however in the thickness, size and shape of the vessels. Some have handles, or lugs; some have none. Some are canoe-shaped, the bow being the "pouring out" end; others are

round, and some have rims with turned-in edges. There are both deep and shallow vessels, but no evidence that pottery covers were used. I have found one or two sherds, as the broken pieces of a pot are called, that indicate in what manner vessels were built up. This was done by coiling bands of wet clay one upon another, and afterward smoothing these down with a stone or other flat object. When one considers that the Arawak did not know the use of the potter's wheel, it seems remarkable that they could fashion their vessels with so much delicacy of outline, and such superior workmanship.



Three handles of pottery vessels. The first is a crude representation of a human face, the second shows incised decoration. The third handle must have been made by pinching the material of the vessel while still plastic with the thumb and index finger



AT A WELL IN SOMALILAND

AN EPISODE OF A MUSEUM EXPEDITION

By Carl E. Akeley

With photographs by the Author

IT was a couple of days after crossing the Houd — we had come a hundred miles of waterless desert in Somaliland. We were camped beside a "tug," a dry river course where by digging wells in the stream bed sufficient water for the camels and sixty men was obtainable. Hunting in the open bush of the region, we had seen many ostriches during the two days. It was my first experience with these wary birds and they had managed to escape on each and every occasion of our meeting. I found that instead of hiding their heads in the sand, leaving the great black bodies as targets for my rifle, they kept their bodies hidden behind the bush with only their heads exposed, each head just large enough to carry a pair of very keen eyes. As a result of being continually outwitted by them I came to feel that an ostrich was game well worth while, that I would rather bag an ostrich than a lion.

One Sunday morning I set out with the intention of devoting the day to an ostrich hunt. Concluding that the smaller the party the better the opportunity, I took only a mule and my syce. In the early morning when only a half mile from camp I met an old hyena who was loafing along after a night out. A moment later one look at his dead carcass was enough to satisfy me that he would not make the desirable specimen I had thought, for his skin was badly diseased. A little later I shot a good wart hog for our scientific collection. Leaving the specimen where it lay, I marked the spot and continued in search of the plume-bearers.

A little way farther on I climbed to the

top of a termite hill about eight feet high to look the country over with field glasses. As I held the glasses to my eyes while adjusting the focus, I suddenly realized that the letter *S* that I was focusing on was the head and neck of an ostrich and that there was a second letter *S* beside it. The birds remained perfectly motionless watching and I did likewise, locating their position meanwhile by the termite hills which were nearly in line between us. Suddenly the heads ducked and disappeared behind the bush. I dropped from my perch and ran rapidly to where they had been, but found only their trail in the sand.

When I had given up tracking them and was about to start farther afield, I came into an opening in the bush that was about thirty yards wide and two hundred yards long. Near the center of the opening was a dense green bush a dozen feet in diameter. A beautiful cock ostrich broke into the clearing at full speed just below the bush and as I raised my rifle he disappeared behind the bush, so I held ready to catch him as he passed over the remaining fifteen or twenty yards of clear ground. I stood there ready until I felt foolish, when I ran quickly to the bush expecting to find him just on the other side. He was nowhere in sight but his trail told the story. As he had come into the open he had seen me and when behind the bush he had stopped short as indicated by a great hole and swirl of sand where he had caught himself by one foot, had turned at right angles and run straight away the length of the clearing, keeping the bush between himself and his enemy. I got one shot

at him later—putting my sights at seven hundred yards, I placed a bullet in the sand between his legs.

We returned to camp later in the afternoon and after a little rest and refreshment I started out again with only the syce and carrying the necessary tools to get the head of the wart hog that I had shot in the morning. We had no difficulty in finding the place but there was nothing to be seen of the pig. The place was strewn with vulture feathers but surely vultures could not make away with the bones. A crash in the bushes at one side led me in a hurry in that direction and a little later I saw my pig's head in the mouth of a hyena traveling up the slope of a ridge out of range.

We started for camp as the sun was setting. As we came near to the place where I had shot the hyena in the morning it occurred to me that perhaps there might be another hyena about the carcass and feeling a bit "sore" at the tribe for stealing my wart hog, I thought I might pay off the score by getting a good specimen of a hyena for the collections. The syce led me to the spot but the dead hyena was nowhere in sight. There was the blood where he fell and in the dusk we could make out a trail in the sand where he had been dragged away.

Advancing a few steps a slight sound attracted my attention and glancing to one side I got a glimpse of a shadowy form going behind a bush. I shot hastily into the bush, and as we started forward the snarl of a leopard warned us of the chances we were taking. We waited a few moments and there was no further demonstration.

I began looking about for the best way out of it, for I had no desire to try conclusions with a possibly wounded leopard when it was so late in the day that I could not see the sights of my rifle. My intention was to leave it until

morning and if it had been wounded, there might then be a chance of finding it. I turned to the left to cross to the opposite bank of a deep narrow tug and when there I found that I was on an island where the tug forked and by going along a short distance to the point of the island I would be in position to see behind the bush where the leopard had stopped.

While peering about I detected the beast crossing the tug some fifteen yards above and foolishly began shooting while I could not see to aim. I could see where the bullets struck as the sand spurted up beyond the leopard. The first two shots went above her, but the third scored. The leopard stopped and I thought she was killed. The syce broke into a song of triumph which was promptly cut short by another song such as only a thoroughly angry leopard is capable of making as it charges. For just a flash I was paralyzed with fear, then came power for action. I worked the bolt of my rifle and was conscious that the magazine was empty. At the same instant I realized that a solid point cartridge rested in the palm of my left hand, one that I had intended as I came up to the dead hyena to replace with soft nose. If I could but escape the leopard until I could get the cartridge into the chamber!

As she came up the bank on one side of the point of the island, I dropped down the other side and ran about to the point from which she had charged, by which time the cartridge was in place, and I wheeled—to face the leopard in mid-air. The rifle was knocked flying and in its place was eighty pounds of frantic cat. She struck me high in the chest and caught my upper right arm with her mouth, chewing and growling fiercely. With my left hand I caught her throat and tried to wrench my right

arm free but succeeded only in drawing the full length of the arm through her mouth an inch at a time. I was conscious of no pain, only of the sound of the crushing of tense muscles and the choking snarling grunts of the beast.

We went to the ground, the leopard underneath, my right hand in her mouth, my left clutching her throat, my knees on her lungs, my elbows in her armpits spreading her front legs apart so that her frantic clawing did nothing more



The natives come long distances to water their camels and sheep at the wells of the desert



Three camel men of the expedition. Natives of Somaliland are devotees of courage and ostracize any of their fellows who show the white feather

than tear my shirt. Her body was twisted in an effort to get hold of the ground to turn herself but the loose sand offered her no hold. For a moment there was no change in our positions and for the first time I hoped for a chance. Up to then it had been simply a good fight in which I expected to lose, but if I could keep my advantage perhaps the syce would come with a knife. I called but to no effect. I still held and surged down with my knees; one hand down her throat as far as I could thrust it and the other gripping her throat, was certainly a strangle hold. I felt her relax, a sort of letting go although she was still struggling. At the same time I felt myself

weakening similarly, and then it became a question as to which would give up first.

After what seemed an interminable passage of time, I let go and tried to stand, calling to the syce that I was finished. He now screwed up his courage sufficiently to approach. Then the leopard began to gasp and I saw that she might recover, so I asked the syce for the knife. He had thrown it away in his fear, but quickly found it and I at last made certain that the beast was dead. I tried to shoulder the leopard to carry it to camp but was finally satisfied to get myself to camp.

When I came inside the *zereba*, my companions were at dinner before one of the tents. They had heard the shots and had speculated on the probabilities. They had decided that I was in a mix-up with a lion or with natives, but that I would have the enemy or the enemy would have me before they could get to me, so they had continued their dinner. The fatalistic spirit of the country had prevailed. When I came within their range of vision however, my appearance was quite sufficient to arrest attention and moreover my demands for all the antiseptics in camp gave them something to do. While my companions were getting the surgical appliances ready, my boys were stripping me and dousing me with cold water, and at that time I regretted that the leopard had not been victorious.

Later in the evening they brought the leopard in and laid it beside my cot. The first shot as she went behind the bush had broken the toes of the right hind foot. The only other bullet that struck her was the last before she charged and that had creased her just under the skin on the back of the neck, from the shock of which she had instantly recovered.



Some of the Somali wells are eighty feet deep and require at least eight natives supported one above the other on steps along the walls of the well, to pass the water in wooden buckets (*chatties*) to those waiting at the top

NEWS FROM THE CROCKER LAND EXPEDITION

By Edmund Otis Hovey

THE Museum received advices November 23 from the Crocker Land expedition to the effect that Donald B. MacMillan, leader of the expedition, accompanied by Ensign Fitzhugh Green, engineer and physicist of the party, had journeyed one hundred and twenty-five miles northwest from Cape Thomas Hubbard across the ice of the polar sea in search for Crocker Land, the land whose mountainous heights Admiral Peary thought that he descried from an elevation of 1,400 feet on Cape Thomas Hubbard in 1906. For two days Messrs. MacMillan and Green thought that they saw land, but this proved to be a mirage, and they finally concluded that Crocker Land does not exist, at least within the range originally ascribed to it.

The journey out and back from Cape Thomas Hubbard occupied two months and proved to be extremely perilous. The party crossed thirty-eight leads on thin ice, lost most of their dogs on the journey and on the day after they got back to Cape Thomas Hubbard, in the middle of May, "the ice on the polar sea broke up and became a hideous, grinding chaos of broken ice on which they would certainly have perished had they not got back as they did."

Mr. W. Elmer Ekblaw, geologist and botanist of the expedition, through whom the foregoing announcement has come to the Museum, writes further as follows, his letter being dated August 29, 1914, and written on board Knud Rasmussen's motor boat just south of Cape Alexander, only fifteen miles from Etah:

Knud Rasmussen's boat (small motor boat) has got to a hunting camp where Jot

Small and I have been kept for six days by ice and wind, unable to return by our motor boat past Cape Alexander to Etah, and Rasmussen's boat can not get by either. His ship must leave [Thule, North Star Bay] for Denmark day after to-morrow. On account of ice conditions his motor boat can not wait to go to Etah after our mail and MacMillan's cablegrams. Jot and I came down with three Eskimo to kill walrus for our winter supply and have been unable to get back since August 24. Thus we met Rasmussen's boat. I may say that we are all well, and have given up hope for a ship from America this year; that Mac has said that we *must* get back next year; that we are trying against heavy odds to get a wireless through this coming winter; that we are planning a strenuous year's work for this next season; and that everything thus far has been eminently successful, both exploration and scientific work.

I am very much concerned as to what effect this inability of Rasmussen's boat to get to Etah will have, but we have been up to the very base of Cape Alexander (a quarter of an hour ago) and the sea is raging. Apparently there is no hope to get any of our mail back until winter sledging begins. Then we shall be able to get our mail through as we did last year, from Upernivik.

Tanquary and I spent the summer at Umanak, North Star Bay, studying the geology and biology of the region there. MacMillan and Green got back in the middle of May after two months on the trail. I had to return from Bay Fjord because of a frozen foot (all well now). Only three of us started, with seven Eskimo, ten sledges in all.

At the best I have only a few more minutes to write, for Rasmussen's men will stop only long enough, when they reach our camp again, to unload the supplies and mail, for the seas and ice necessitate their immediate return to North Star Bay. Ice conditions all along the coast have been bad this year.

In conclusion, let all our friends know that we are well and contented, that for another year at least, we have plenty of everything we need to keep the wolf from the door of our igloo. Tell our friends that though we think of them often, our work is not yet

done, and until it is we shall not be homesick. Finally, best regards to everybody.

Also commend K. Rasmussen for his unswerving, continued and exquisite courtesy toward our expedition. I think some public mention should be made of it.

Of course the organizing institutions, the American Museum of Natural History, the American Geographical Society and the University of Illinois, are keenly disappointed to learn of the non-existence of Crocker Land at the place where it was reported to be, but they await receipt of the full reports which will come from Mr. MacMillan next April or May before drawing any conclusions from this portion of the Crocker Land

expedition's work. Undoubtedly the scientific data, including soundings, which must have been secured by Mr. MacMillan and Ensign Green will prove of the highest value, even if they show that the supposed land does not exist. Mr. Ekblaw's letters indicate that all the other portions of the program of work were carried out satisfactorily and although we have not the gratification of getting full reports and personal letters from all the staff, we know that the men were at Etah and well at the end of the summer and that they received the missives which were sent to them by way of Copenhagen last spring.

MUSEUM NOTES

THE sixth annual joint session of the American Academy of Arts and Letters and the National Institute of Arts and Letters was held in New York on November 19 and 20. The President and Trustees of the Museum tendered a reception to the members of these two academies and a representative of the Académie Française. The reception also marked the opening of the "Men of the Old Stone Age" exhibit on the fourth floor of the Museum.

MR. MINOR C. KEITH has deposited the greater part of his archaeological collection from Costa Rica in the Museum as a loan. The collection consists of a large number of gold and jade objects and a very complete series of ceramics numbering many thousand specimens. To accommodate this loan collection, rearrangement of the Mexican hall has been made necessary. The small rooms adjoining the second floor entrance will be used temporarily for the exhibition of some of the casts formerly displayed in the Mexican hall.

THROUGH the coöperation of the Trustees and the personal interest of President Henry Fairfield Osborn, the employees of the American Museum have organized a store whereby they are enabled to secure food products at a slight advance over cost.

The initial steps for the organization were taken by a committee appointed by President Osborn, who having in mind the furtherance of his plan to benefit the employees materially, appointed a subcommittee of the Trustees to hear the plans of the organization and report the feasibility of the undertaking. The project received the sanction of the Trustees, a permanent organization was effected and an authorized capitalization of fifteen hundred dollars was voted by the employees. All of the money necessary to conduct the business has been subscribed by them and its affairs are administered entirely outside of Museum hours.

The store proper is advantageously situated in a room in the basement and the work there is performed by a storekeeper and assistant hired by the association. The project is distinctively coöperative, with authorized payment of dividends on capital stock, the creation of a reserve fund and the distribution of any remainder as a bonus according to the amount of the purchases of the subscriber.

Besides dealing in staple food products, the store supplies the employees with lunches, handles fruit and receives orders for certain other household commodities. The privileges of purchase have been extended to all employees and members of their families,

to those affiliated with the Museum and to the employees of similar institutions.

The store was opened for business on November 7. Its success has far exceeded the expectations of the officers and it will soon be incorporated under the laws of the State.

WORD was received from the Congo expedition November 6, that twenty-two cases of zoological material had been shipped from Stanleyville. It is expected that Mr. Chapin will sail for home on the steamship "Hawaiian" on November 18 and that Mr. Lang will follow as soon as all arrangements for shipment of the remaining collections can be made.

SINCE the last issue of the JOURNAL the following persons have become members of the Museum:

Life Members, MRS. C. H. ISHAM and MESSRS. CHAUNCEY M. DEPEW, JR. and WILLIAM DUTCHER;

Annual Members, MRS. HENRY HERSEY ANDREW, MRS. G. A. ARCHER, MRS. GEORGE L. CARNEGIE, MRS. LEOPOLD COHN, MRS. GODDARD DUBOIS, MRS. F. LAWRENCE EMBREE, MRS. EDWARD N. GIBBS, MRS. GEORGE WALTON GREEN, MRS. CHARLES L. LIVINGSTON, MRS. HERBERT MCBRIDE, MRS. E. HOWARD O'FLYN, MRS. CHARLES LANE POOR, MRS. JOHN ROGERS, JR., MRS. J. TROWBRIDGE VREDENBURGH, MISSES MILLICENT F. EADY, M. D. GRAHAM, BLANCHE HIRSCH, FRANCES E. MARTIN, LOUISE VELTIN, DR. G. K. DICKINSON, DR. GEORG ORNSTEIN, and MESSRS. BENJAMIN ABERT, GEORGE GORDON BATTLE, A. H. BRAWNER, G. H. EISWALD, LEWIS A. ELDRIDGE, HENRY FLETCHER, GOELET GALLATIN, WALTER FULD GIPS, PETER GOULED, G. S. GREENE, JR., A. AUGUSTUS HEALY, FREDERICK R. HOISINGTON, ALFRED J. JOHNSON, LOUIS LONG, WILLIAM A. MOORE, AARON NAUMBURG, WILLIAM E. REED, E. QUINCY SMITH, RAYMOND W. STORM, MAURICE S. H. UNGER, ELMORE CURT WALTHER, LOUIS M. WEILLER and GEORGE L. WHEELOCK.

IN the New York City building at the Panama-Pacific Exposition, the gardens, libraries and museums of New York will have a booth some twenty-four feet long at the left of the entrance, with interior and exterior wall space for the display of photographs. Each institution of the city has been allotted approximately ninety square feet of surface. The Museum's representative on the com-

mittee of arrangements is Dr. Chester A. Reeds of the department of geology and invertebrate palaeontology.

THE MUSEUM has just received from Messrs. M. Guggenheim and Sons the gift of a small collection of prehistoric objects found in a copper mine at Chuquicamata, Chile. The collection consists for the most part of hafted stone hammers and wooden scrapers. These were the implements used by the Indians in pre-Spanish days in collecting the copper (atacamite) with which they made knives and other implements.

REV. GILBERT L. WILSON, who for several years has been working among the Hidatsa Indians of North Dakota under the direction of Dr. Clark Wissler, curator of the department of anthropology, has this year been devoting himself to the study of primitive Indian agriculture.

THE value to the artist and art student of the Museum's collections of objects from prehistoric and present primitive peoples is rapidly becoming known. There have always been a few teachers who have understood the richness and value of this field, and who have occasionally sent their pupils here to copy primitive designs and color schemes. The number of students who have availed themselves of this privilege during the last two years however reaches several thousand. For the study of conventionalized figures and color schemes to be employed in carpet, rug and wall paper manufactories or to fill some of the many needs where designers are required, there is certainly no better original field than that presented in the ancient Peruvian textiles and pottery vessels as well as in numerous objects in the American Indian collections on display in the American Museum.

THROUGH the courtesy of Dr. J. Leon Williams his private collection of casts of prehistoric human remains from the Pleistocene of Europe was placed on exhibition last winter in the fossil mammal hall on the fourth floor of the Museum, where it has attracted much interest. This exhibit has now been rearranged and greatly extended in connection with the studies upon "Men of the Old Stone Age" by Professor Henry Fairfield Osborn.

The new exhibit, opened to the public on

November 22 serves to show the progress of discovery, especially in the last few years with regard to the primitive races of man which inhabited Europe during and since the Great Ice Age. In addition to the casts of the more important skulls and other remains, there are weapons and other implements illustrating the successive cultural stages and illustrations of the remarkable drawings and sculptures preserved in the caverns of France and Spain. Reconstructions by Dr. J. H. McGregor of the heads of the three principal ancestral types of man, the *Pithecanthropus* or Ape-Man of Java, the *Eoanthropus* or Piltdown Man, and the Neanderthal Man (*Homo neanderthalensis*) are believed to be as nearly accurate as it is possible to make them. Two of Mr. Charles R. Knight's brilliant restorations further illustrate the appearance and habits of the most important types of palaeolithic man, the Neanderthal and Cro-Magnon races. A series of skulls and other remains of living and extinct primates, lemurs, monkeys and anthropoid apes, serves for comparison with man's nearest relatives and collateral ancestors among the lower animals. The subject of prehistoric man, his ancestry, environment, habits and culture, will be fully and authoritatively treated in Professor Osborn's forthcoming book.

ALTHOUGH the City did not make the desired appropriation for the extension of the Museum's educational work, so many urgent requests have been received from teachers of the lower east side for the opening of a lecture center to accommodate the pupils who cannot come to the Museum that a local lecture center has been opened at the Washington Irving High School. The courtesy of the high school in placing its hall at the disposal of the Museum is greatly appreciated and marks an important step in the coöperation of public schools and the Museum.

MR. JAMES BARNES of the Barnes-Kearton expedition opened the series of lectures in the members' course on November 12 with one of the most interesting sets of motion pictures that has ever been shown at the Museum. Mr. Barnes has very kindly presented a set of his films to the Museum that they may be preserved as permanent records.

DURING the summer the scientific survey of Porto Rico made considerable progress. In

this work several departments of the Museum are coöperating with the New York Academy of Sciences, under whose general auspices the survey is being prosecuted. Following the preliminary work last spring by Professor Crampton and Dr. Lutz more detailed investigations were made during July and August. Mr. Roy W. Miner devoted several weeks to the study of marine invertebrates, especially those of the harbor of San Juan. He also made investigations at Ponce, Mayaguez and in some inland situations. Mr. John T. Nichols of the department of ichthyology and herpetology began the investigation of the fishes with very satisfactory results in the way of an extensive series of types and in the addition of new records to the little-known fish fauna of this island. Mr. F. E. Watson of the Museum with Mr. H. B. Barber of the Academy carried forward the entomological investigations on the island, making extensive collections in a number of the characteristic ecological localities.

In December Professor Crampton will make another visit to the island in order to present a report of progress to the Governor and Legislature of Porto Rico and to take back a series of named specimens which may serve as a nucleus for an island museum. He will also carry on field work in the region of Guanica Harbor and in the arid southwestern portion of the island where a typical desert locality is to be found.

MR. WILLIAM B. PETERS of the department of preparation and Mr. Prentice B. Hill, assistant in the department of geology, have returned from Weyer's Cave, Virginia, where they secured a quantity of material from grottoes which have lately been discovered in the cave. This is to be used, together with the collection made last year, in the reproduction of a typical grotto in the Museum, work on which is progressing rapidly.

MR. A. J. MUTCHLER and MR. F. E. WATSON of the department of invertebrate zoölogy have recently returned from four weeks' work in Florida, where they have been making a survey of the insect life of the northern part of the state. In spite of the unfavorable weather conditions, more than eight thousand specimens of insects were secured.

DR. FRANK M. CHAPMAN has just returned from Heron Lake, Minnesota, where he made studies for a group of the birds of that region.

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